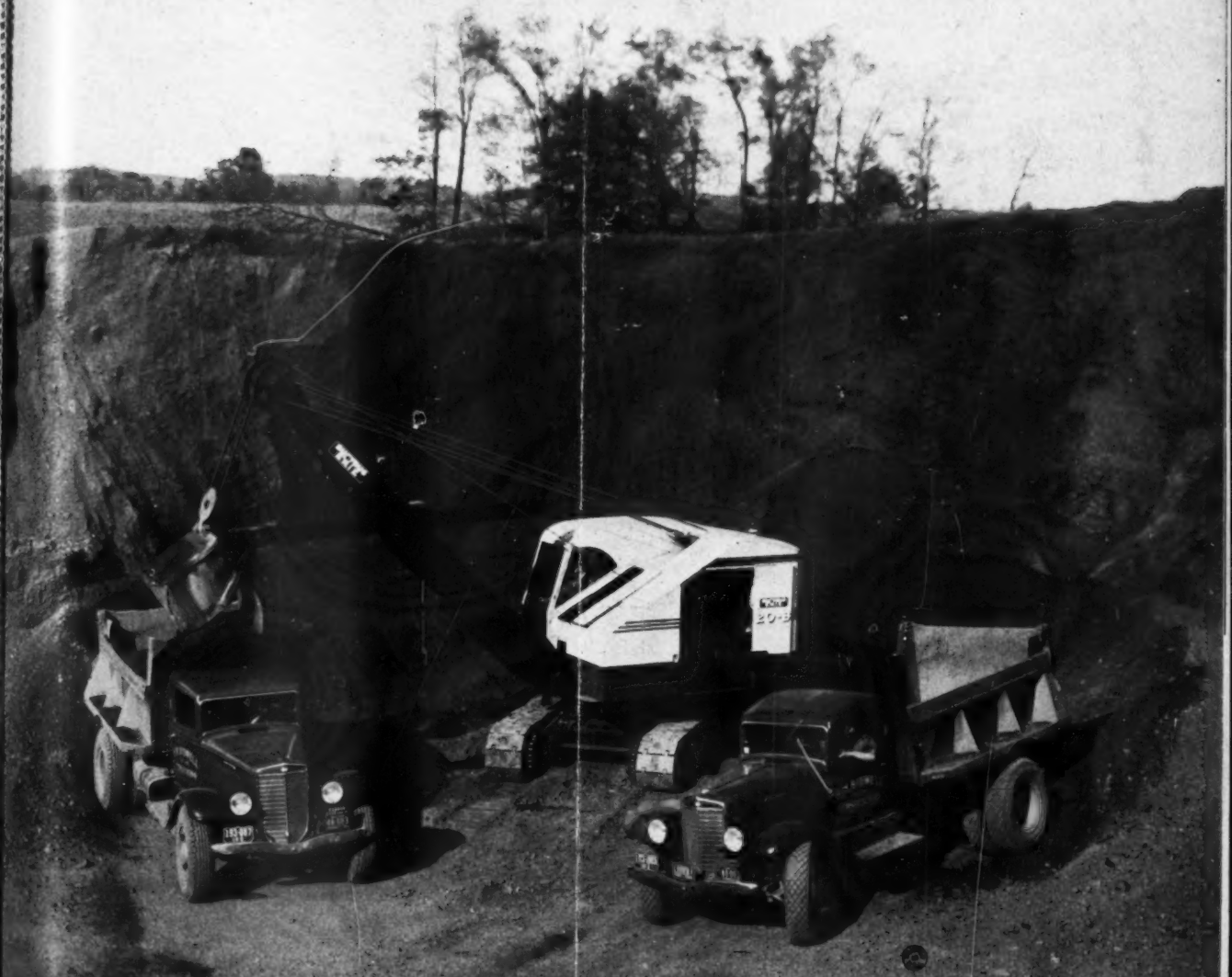
EXCAVATING ENGINEER

FOUNDED 1905



With double-spotting like this, a shovel really goes to town. This 3/4-yard rig is loading gravel for a Connecticut road job.

December 1938 Number 12

YOU CAN STRIP IT CHEAPER

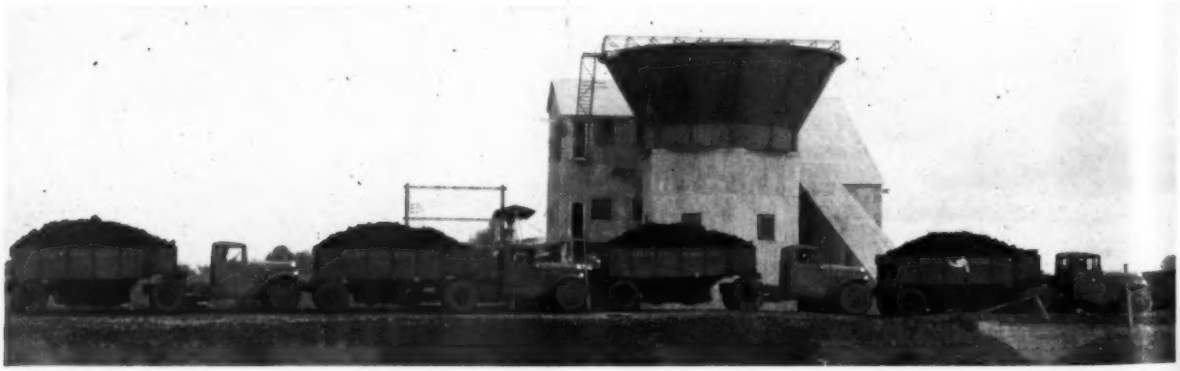
With Sanford-Day's Automatic Bottom-Dumping Trailers

STRIP YOUR COSTS AS YOU STRIP YOUR COAL

Study the illustration above. It shows you how the famous S-D principle of bottom discharge mine cars has been adapted to S-D rubber tired trailers. Doors are tripped automatically as the trailer reaches the hopper or storage bin . . . then closed automatically as the trailer leaves the bin . . . both operations accomplished solely by the travel of the trailer across the bin . . . no manual labor whatsoever. Here, we have given you the whole story in a nut-shell . . . actual operation is as simple as telling about it. This simplicity . . . absence of all tricky gadgets . . . no loss of time . . . sturdy construction for heavy service, and easy, fast manipulation are reasons why S-D Trailers are cutting hauling and dumping costs for many operators.

S-D Trailers are built in 6 to 50 Ton capacities, all of which have a very low center of gravity, due to their particular design. If you have any idea that S-D Trailers might save you money, let one of Sanford-Day's engineers tell you what they are doing for others, and why.

Note . . . Here are four 16 ton S-D Automatic Bottom Dump Trailers in operation at an Illinois plant. They have hauled and dumped over 2700 tons in a 7 hour day.



SANFORD-DAY IRON WORKS 602 Dale Ave., Knoxville, Tenn., U. S. A.

MINE CARS, ALL TYPES — TRAILERS — WHEELS — SHEAVES

EXCAVATING ENGINEER

FOUNDED 1905

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LOOKING AHEAD

These interesting articles will appear in an early issue of EXCAVATING engineer. Watch for them.

1939 Highway Forecast

As in past years, the January Excavating Engineer will contain the most complete data available on 1939 highway construction and maintenance in all 48 states. Be sure not to miss this unusual presentation.

County Road Work

Clay County, Missouri, finds 3½-yard scraper a handy all-around tool for road work.

Highway Work In Peru

Modern equipment plays an important part in the present and projected highway development in Peru.

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FAST MOVES - on the job - between jobs

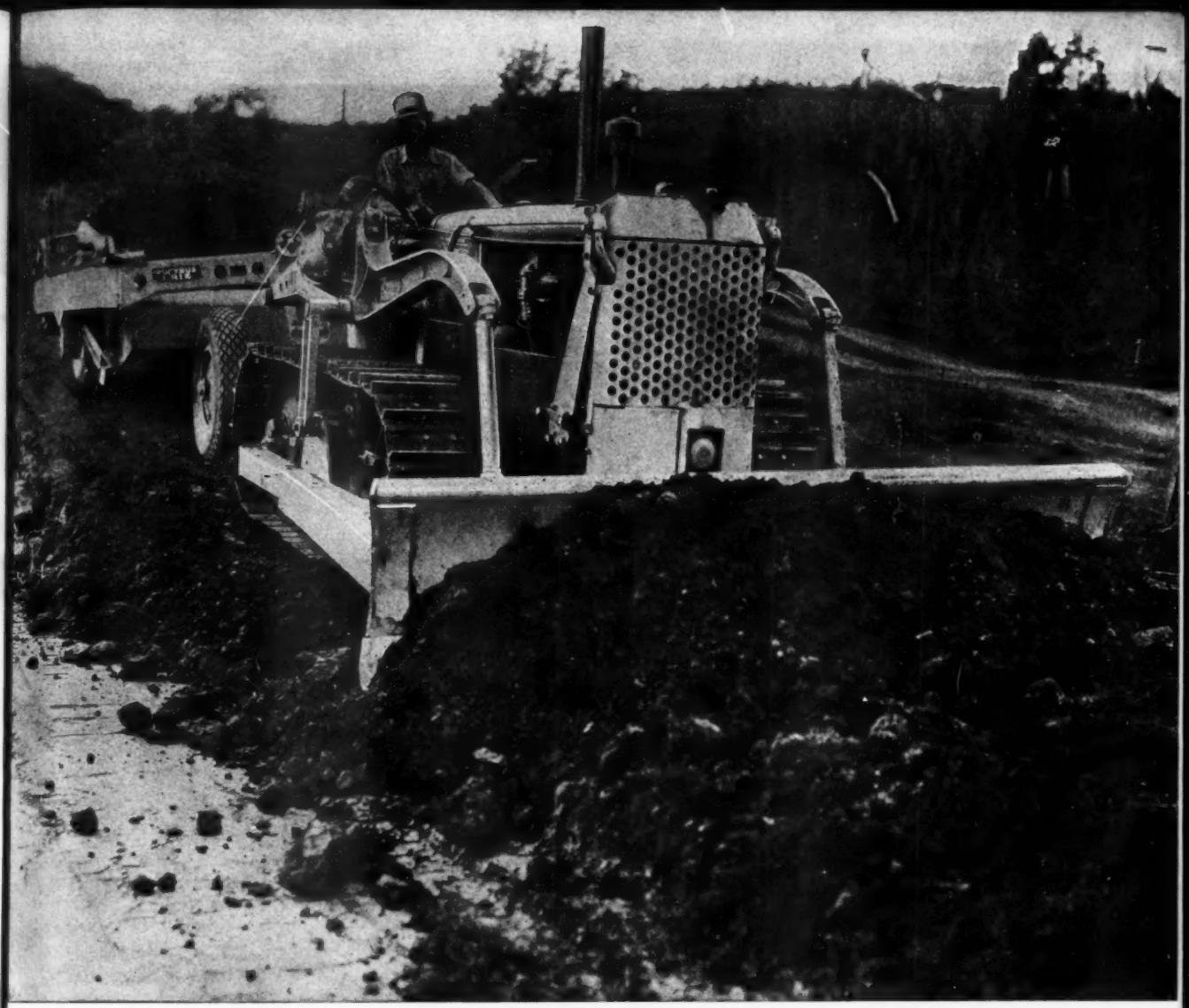
ROADBUILDING and maintenance requires frequent quick moves on the job, and fast moves between jobs. Bucyrus-Erie's famous 10-B has long been a time- and money-saver on road work with its exceptional mobility and travel speeds to 4¼ m. p. h. It climbs grades of 30 per cent or more and maneuvers easily over rough ground. It can be transported at fast trucking speeds on its own fast-loading trailer, or on a platform-type motor truck. The 10-B is full-revolving and loads anywhere within the long, high reach of its dipper. It can dig close to its cats and holds accurate grades. It will pay you to know the full story on this world's fastest selling excavator.

BUCYRUS ERIE

BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.



This combination outfit — an International TD-40 Diesel TracTracTor with bullgrader and scraper — is capable of handling a wide variety of dirt-moving jobs. It digs dirt and places it in the fill, levels the fill, keeps the hauling road in good shape, backslopes, builds shoulders, cuts ditches, etc., providing speed, efficiency, and economy.

INTERNATIONAL TracTracTors . . .

the Most Accessible, Most Easily Serviced Crawlers

When International Harvester engineers started laying out International TracTracTors, they designed for power . . . and for accessibility of all working parts to keep maintenance costs at the minimum. Every owner and operator knows the results — TracTracTors are the most accessible, most easily serviced crawler tractors on the market. All parts are so easy to get at that maintenance is surprisingly low. Steering clutches and brakes in TracTracTors can be inspected, adjusted, or replaced through rear cover plates without disturbing the track, track frame, or driving sprocket.

Special dust seals protect the bearings of the drive gear and pinion shaft, the track rollers, and idler bearings. Oil and lubricants are sealed in. Dirt, grit, water, etc., are sealed out.

International TracTracTors save money in crawler-tractor operation. Cost sheets of owners prove it again and again. Find out for yourself what these units can do for you. Ask the nearby International industrial power dealer or Company-owned branch for a demonstration. There are five different models (gasoline and Diesel). The International Industrial Power line also includes five wheel-type tractors (gasoline and Diesel); and 11 Power Units ranging up to 110 max. h.p. (gasoline, gas, and Diesel).

INTERNATIONAL HARVESTER COMPANY
(Incorporated)
180 NORTH MICHIGAN AVENUE CHICAGO, ILLINOIS

INTERNATIONAL Industrial Power

A heaping dipper load goes into the truck. DeRuyter Brothers are hanging up excellent dirt-moving figures on this Minnesota road job.

Grading A Minnesota Highway

DeRuyter Brothers handle excavation for 367,000-yard job near Minneapolis with shovels, draglines, elevating grader and scrapers.

ON OCTOBER 1, DeRuyter Brothers, whose home office is at Wilmar, Minnesota, moved in on a road grading job about 23 miles Southwest of Minneapolis. The contract calls for the excavation of 367,000 yards of sand, loam and clay, mostly borrow, and an additional estimated 800 hours of dragline excavation which is mostly swamp peat. Due to the lateness of the season when the contract was let, the job will be shut down for the winter, and finished next Spring.

The job is four miles long, a Federal Aid project on which a separate contract will be let for the paving. Top width of present grading operations varies from 38 to 60 feet. Nine culverts are included in the work; one bridge and one railroad overpass were constructed under a previous contract, although DeRuyter Brothers are handling fill and grading for the overpass approaches.

The firm of DeRuyter Brothers is composed of three brothers, Fred, John and Thomas. All three are actively engaged in supervising the various phases of work on this road. James A. Millet is Project engineer for the State.

Hilltop Swamp

When the job was visited early in November, two draglines were excavating on what is, geologically, the most unusual feature of the job. This is a section of swamp which occurs at the crest of a low hill. Tractor equipment was handling excavation for the overpass approaches, and two shovels were sending dirt from a big borrow pit to fill the wet area excavated by the draglines.

More unusual than the physical features of the work is the excellent system and equipment by means of which DeRuyter Brothers are literally making the dirt fly.

At the west end of the job, which is about two miles from the town of Shakopee, the material is a white sand so soft as to make the use of trucks for hauling difficult or impossible. Consequently, tractor equipment has been assigned the job. An Adams elevating grader with a 42-inch belt is loading Euclid and Western 7- and 8-yard bottom dump wagons, 11 of them, pulled by a Caterpillar RD7 and a fleet of Caterpillar 60's. In "2-wagon trains," these units are hauling the sand 2,000 feet to the overpass approaches. Here a Baker bulldozer on an Allis-Chalmers "K" tractor handles the grading and the shaping of the steep side banks. A total of 60,000 yards will be excavated by the Adams elevating grader in this west-end borrow pit.

Two LeTourneau G6 scrapers, pulled by Caterpillar 60's are also working on the west end. Their job is to handle short-haul cut and fill work west of the overpass.

Shovels in 126,000-Yard Borrow Pit

In the center section of the job two shovels are working in a big borrow pit, from which a total of 126,000 yards will be taken. At present, the haul from shovels to fill is 3600 feet, but this will lengthen as the job progresses. The two shovels are a Bucyrus-Erie ¾-yard 20-B and a Bucyrus-Erie ⅜-yard 10-B, the former be-

• 60,000 yards at the west end of the job are being handled with this Adams elevating grader loading Caterpillar-drawn Euclid and Western wagons.

ing purchased new for this job. Both rigs are equipped with Bucyrus-Erie dippers having the patent inserted, reversible Tiger Teeth. Material being loaded is a sandy loam, ideal for handling by shovels. The two rigs are loading from a 20-foot bank. As a rule, the dippers get a heaping load when they have been passed through only half the bank.

A total of 15 Ford V-8 trucks, equipped with 3-yard Gar Wood dump bodies and Firestone Ground Grip tires, are serving the two shovels. These units operate on a circular haul which enables them to pull in at either shovel, as they may be needed. As a result of this haulage plan, it is seldom that either shovel has to wait for a truck.

Since the material in this borrow pit is quite sandy, and since there is water relatively near the hauling surface, wet weather presents a problem in keeping the hauling road in condition to keep the trucks moving fast. This is handled by a Caterpillar RD5 tractor mounting a La-Plant-Choate bulldozer. This unit also handles utility grading and dozing work when not needed to keep the hauling road in shape.

As the job goes ahead, and the haul lengthens, the truck fleet will be increased. DeRuyter Brothers have a total of 35 of the speedy 3-yard Fords available.

System Produces Big Output

With the haulage system set to keep the shovels going at top speed, impressive output records are being hung up. According to Fred DeRuyter, the ¾-yard 20-B is moving 120-yards, bank measure, per hour. The ⅜-yard 10-B loads between 75 and 80 yards, bank measure, per hour, in the same material. You have only to watch the job for awhile to see what is behind these outstanding figures. Trucks "flow" to and from the shovels smoothly, and without delay and every dipper load is a heaping one. Good dirt, good operators keeping the shovels stepping, and a haulage system that permits a high operating efficiency —these are some of the important factors accounting for the speed being achieved on this job.

• Top: Swamp excavation is part of the 800 dragline hours on the job. In the foreground is the new Bucyrus-Erie 20-B. Behind is a Mead-Morrison. Both rigs are equipped with ¾-yard Page buckets. Bottom: 3 yards go into the fill. Behind the Ford truck is an "A-C"-mounted Baker bulldozer used in building out the fill.

When the job was visited, the fill was going into a swamp cut excavated by two ¾-yard draglines. This "hilltop swamp" is probably spring fed, and has a loose surface without firmness in the soil. In removing the muck, the draglines are making a cut 8 feet deep and about 50 feet wide. Excavated material is piled at both sides of the cut. Later, the draglines will load it to trucks and it will be distributed to the borrow pits and on the side slopes of the road.

Fill from the shovels is being back-dumped by trucks into the water-filled channel left by the draglines. The fill is shaped as it grows by a Baker bulldozer mounted on an Allis-Chalmers "K" tractor. Average depth of fill here is 10 feet. Due to the hill slope, however, some spots need less fill than the depth of the cut.

The two draglines are a new Bucyrus-Erie ¾-yard 20-B and an older Mead-Morrison, both equipped with Page buckets. Working on mats, the two rigs are giving a good account of themselves, according to Mr. DeRuyter.

Material to be excavated at the

• Top: The portable cars of the camp are arranged in the same way on each DeRuyter job. In the foreground are cook and mess cars. Bottom: The ⅜-yard Bucyrus-Erie 10-B is loading out 75 to 80 yards, bank measure, per hour, and working a 10-hour day.

east end of the 4-mile job, beyond the present scene of operations, is clay. Work here will include building approaches to a concrete bridge which has already been constructed. When these approaches have been built, the bridge will serve as part of the hauling road used for getting dirt from the big borrow pit to east-end fills.

Portable Camp at Job Site

Operations on this job are conducted on the basis of 10 hours a day, six days a week. This means "staggering" the crews, as the men are working on a 40-hour-a-week limit. About 60 men are on the DeRuyter payroll. Approximately half of these were recruited locally; the others being members of the company's permanent organization.

These latter live in the portable camp located on the job. Composed of big cars on wagon-type wheels, the units of the camp are arranged in the same pattern on every DeRuyter job. Centrally located are office and mess cars, with bunk cars and portable shop arranged around them. Indicative of the systematized organization which contributes so much to the smooth flow of operations is the plan for getting trucks back to work after lunch. Each truck is numbered and has its own parking space, so arranged that the trucks are parked in numerical order. When the one o'clock gong indicates the end of lunch hour, the trucks are warmed up, and pull out caravan-fashion in the order of their numbers. This plan permits work to regain full swing with a minimum of confusion and lost time.

The shop maintained at camp is equipped to handle everything but major repairs. Three mechanics are on full time duty. The shop is equipped with portable welders.

The maintenance system is such as to keep all equipment constantly in A-1 condition, and to reduce idle time to a minimum. All equipment receives regular inspection, greasing, lubrication, etc. Each truck, tractor, shovel, etc., has a record card on which is noted all repairs. If the mechanics note that any machine requires repair too often, it is brought in and given a complete overhauling.

Repair Parts Stocked

A full stock of most-needed repair parts is kept at the camp so replacements can be made promptly and the machine kept idle as short a time as possible. American Steel & Wire cable is used on shovels and draglines. This is ordered by the thousand feet and kept reeled at the camp. The exact length required for any replacement can thus be cut from the spool. There is no waste, and this method not only reduces lost time, but is economical from the buying viewpoint. According to Mr. DeRuyter, he has had 720 hours service from the twin rope crowd on the 20-B.

Crank case oil on shovels and draglines is changed every 60 hours, and gear case oil every six weeks.

The result of the careful maintenance system is that DeRuyter Brothers equipment—old as well as new—is constantly in top operating condition, delivering excellent performance throughout the job.

There's GOLD In That Gravel

A brief account of the beginning of placer gold dredging in the United States

BY JON VAN JON

IT ALL began in 1895. . . . Alder Gulch, Montana, the richest placer area the world had ever seen, was already history. Three acres at Diamond City had produced ten million dollars and had faded. Butte was mining out of silver into the great copper veins, scarcely yet aware that copper and destiny would make it the "richest hill on earth."

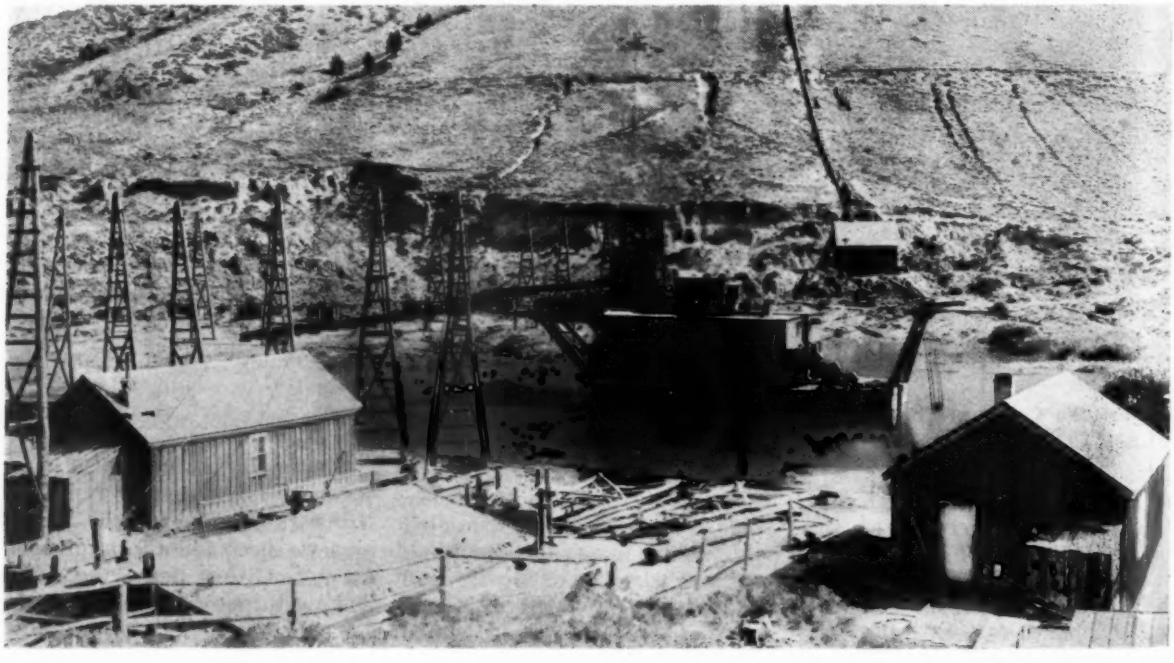
Tonapah, Rhyolyte, Rawhide, and Alaska were still in the future, but already the cream had been skimmed from placer deposits in the United States. And the men who had dropped pick and shovel in lure of silver and the Comstock, turned their thoughts to how they might profitably clean up after the hasty, haphazard, hand methods used by placer miners in the times when there was gold in every stream and a fortune below every riffle.

They all knew some kind of a mechanical system would have to be developed to handle a large volume of gravel at low cost—but no one yet had found the answer. Hundreds of ditch companies were being formed to bring water for hydraulicking. All sorts of weird contraptions were devised and rejected — great wooden wheels which men operated like treadmills, and other devices equally fantastic.

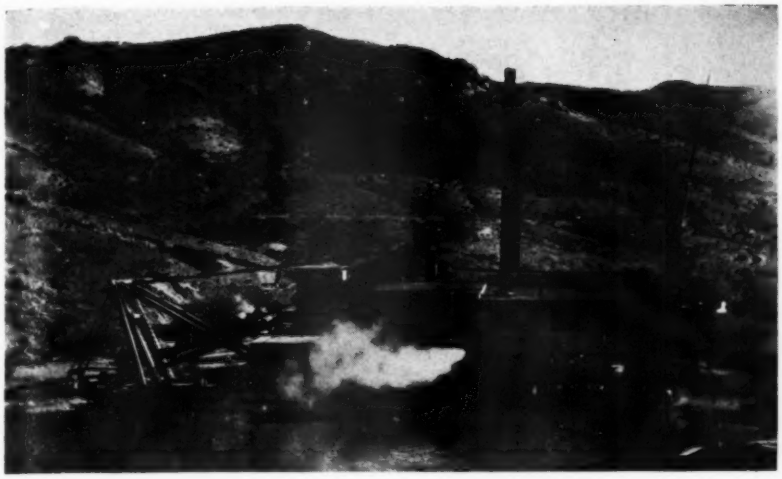
The Dredge Idea

The strange thing is that a "dredge" built in Bucyrus, Ohio, by a company which took its name from the town, had been at work for years dredging the Chicago Drainage Canal. And it was this machine which Samuel S. Harper, a man of money and vision, saw on a trip to Chicago and thought of applying to gold mining. Harper took the idea with him back to Bannack, Montana, where he discussed it with George Metlin, a rosy-cheeked youngster just out of an eastern mining school. Metlin was later to be in charge of the first successfully operated dredge for mining sub-aqueous placer deposits and the first of the million dollar producers.

Harper had obtained options and purchase agreements on the Upper Grasshopper Placer, containing 35 acres, and the Mulkey Placer, containing 41 acres, near Bannack. These agreements were made by J. W. Earl, John W. Williams, and Cyremus Mulkey, owners of the Mulkey Placer; F. L.



• This early operating view shows the electric placer dredge, Fielding L. Graves. Equipped with 5-cubic-foot buckets and a 75-foot ladder, this was the first successful placer dredge.



• About 1898, the A. F. Graeter was working as shown here. This dredge, second of the placer pioneers, started operations on Grasshopper Creek in 1897.

Graves and A. F. Graeter, owners of the Upper Grasshopper Placer. The price paid for the property was $50,000 which included Bannack Ditch and water rights.

At this time three drift mining operations were in progress. Edward Swickey was drifting on what was Kelly Bar, five miles below Bannack towards Virginia City. Rene Curin was operating a drift mine about a mile below Bannack. White and Snyder were operating a drift mine on the Mulkey Placer at Bannack.

Prospecting the Property

Harper and Metlin obtained permission from Curin and Swickey to wash a number of yards of bedrock gravel taken from their workings. The gold recovered was carefully weighed and the value per yard of dirt determined. With this showing and from information obtained from the White and Snyder workings, a report was made upon the estimated returns to be recovered from the workings of these creek bed placer deposits. With this data and the options and purchase agreements, Harper went to Chicago and immediately succeeded in interesting Herman J. Reiling and John S. Fillmore in the enterprise. Upon verification of the values set forth in the report, they made an agreement and started the preliminaries toward construction of a dredge—the first in North America for placer mining.

This dredge, called the Fielding L. Graves, in honor of a pioneer Bannack merchant, was built by the Bucyrus Company which in 1892 had moved to South Milwaukee, Wisconsin. As originally designed for electrical operation, it was a continuous chain and link bucket type, with a ladder length sufficient to dredge to a depth of twenty-five feet. The gravel was run through a grizzly or trommel which rejected the large size rocks, the fines carrying the gold being dumped into a well and elevated by means of a secondary bucket elevator to a sluice box on the upper deck of the boat.

The dredge started operations in September, 1895, and immediately ran into difficulties. It was found that the outboard sluice-boxes had a habit of sagging and spilling the gravel in the middle of the sluice line instead of dumping on the tailing pile as expected. The weight of the sluices, together with the gravel and water, pulled out the "dead men" and let the boxes fall.

The project seemed doomed to failure; however, Harper and Reiling stayed with the ship. Sufficient ground had been opened up under a tremendous handicap to demonstrate that a dredge of this type could probably work placers if the mechanical difficulties were ironed out.

Harper and Reiling, undiscouraged at the close of the season, returned to Chicago and obtained new capital for the venture.

Redesigning the Graves

The Bucyrus Company, builders of the dredge, after their first experiences with it as first constructed, guaranteed to build a machine that would work the gravel and save the gold; furthermore, they promised to have it ready for operation by the beginning of the next mining season. A new contract was drawn up and during the winter of 1895-96, the Fielding L. Graves was rebuilt under this guarantee.

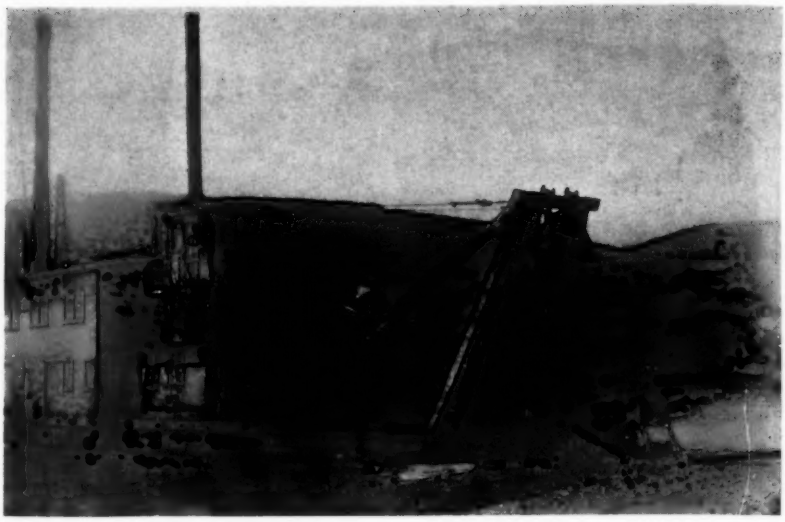
She was equipped with a continuous bucket and link digging end, with buckets of five-cubic-feet capacity. The buckets had two-foot three-inch centers with a link between of the same length. The connecting pins were three inches in diameter. The ladder was seventy-five feet in length and would dig to a depth of thirty-five feet. The bucket chain-speed varied from six to twelve buckets per minute.

The fine gravel with gold content was raised from the gravel well to the upper deck of the boat about sixteen feet above the deck. (In 1898 this process was changed from a bucket elevator to a centrifugal pump.) From here it was delivered into a line of outboard sluice-boxes, sixty feet long, through a flexible hose connection. The sluices were supported on a trailer boat or scow and the tailings dumped back into the excavated space, the tail of the sluice being about six feet above the water in the pond. These sluices were three feet wide, provided with Hungarian riffles faced with one-half by two-inch iron bars.

Work was rushed toward completion of remodeling the dredge and by May 1st, 1896, they were ready to pull the whistle on the new operations that meant millions if successful. Upon resumption of work, the remodeled dredge moved off without a hitch, and immediately started production that met the fondest hopes of the promoters.

The Ball Starts Rolling

Here, finally, was the answer to the long-sought, low-cost method of working placer properties . . . the open gate to a new industry.



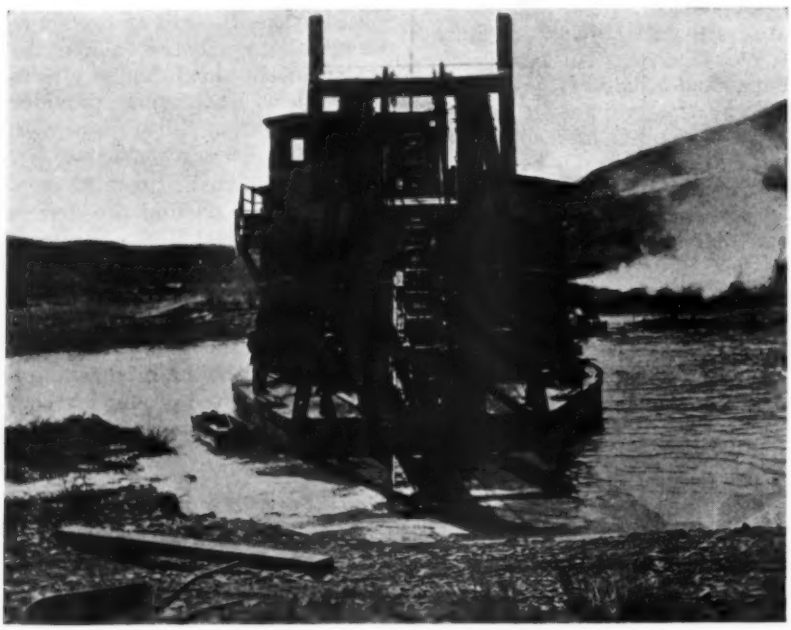
• The dredge Bon Accord, owned by an English Company, shown before it turned turtle and sank. Later raised and sent to Oregon, it had a successful operating history.

Very quickly dredges were put into construction on many projects in different states and foreign lands. It revived the flagging spirits of placer miners throughout the west as nothing else could have done, and created within a few years an industry that grew to the billion dollar class with world-wide proportions.

At this time, the Gold Dredge Company, a Montana corporation, succeeded to the Harper-Reiling interests and took over the work. The success of the enterprise gave a sudden impetus to the new industry. Gus Graeter, an early Bannack pioneer, saw the clean-ups that rivaled early-day production, and was off on a new stampede, anxious to get back in placer mining on the Grasshopper where he had mined the bars years before.

Early in 1897, Graeter and his old-time cow-days associates, Joe Shineberger and Martin Barrett, purchased the placer rights to the Western Mining Enterprise company property, together with the Fink and Meade Placer, owned by H. J. Reiling. They paid $25,000 for the twenty-five acre area. Associating themselves with the Reiling Gold Dredge company, they started construction of the second dredge to be built on Grasshopper Creek.

This dredge, the A. F. Graeter, was almost an exact duplicate of the remodeled Fielding L. Graves with the exception that it was powered by steam, burning cord wood at $5.00 per cord. Owing to the extra space necessary for boiler equipment, the hull was constructed fifty feet wide and one hundred and eight feet in length, somewhat larger than the Graves. The Graeter was rushed to completion and started operations in October, 1897, in the location where Ed Swickey had been drifting in the bed of the Grasshopper Creek two years before. Pay dirt was struck immediately, and the dredge was operated until the Fall of 1899 during which time it returned handsome profits to the owners. Near the end of 1899, both the Graves and the Graeter ceased work when their entire acreage of placer ground was run out.



• Here is the Maggie Gibson, sister dredge to the A. F. Graeter. This was the third of the Grasshopper Creek placer dredges. Originally equipped with suction type machinery, it was soon converted to the bucket digging equipment shown here.

The Third Dredge

During the summer of 1897, a third dredge was started, known as the Maggie Gibson. This dredge was built on what was known as the Excelsior Mill site, the North Excelsior Lode, and that portion of the Jamies Bar Placer lying on the bed of Grasshopper Creek, the total area being but ten acres. The Maggie Gibson was constructed by W. H. Barry, George S. McNeil, Edward C. Smith, and Chas. Gilman, formerly contractors on the Chicago Drainage Canal. The machinery from a suction type dredge was moved to Bannack, a hull constructed, machinery installed, and the dredge put in operation in the fall of 1897. After only a very short time, it was demonstrated very conclusively that a suction type machine was unfitted

(*Continued on page 632*)

HOW TO PROFIT THROUGH MAINTENANCE

By LEE DU BOIS

A REGULAR and thorough maintenance program is essential if you are to get regular and continuing profits from your excavating equipment. While a machine is new, you may get good service from it without paying particular attention to maintenance. But sooner or later, you must pay for maintenance—whether you get it or not. Parts will wear out sooner than they should; you won't get as large output as you did at first; sudden breakdowns—usually coming in the middle of a rush job—will tie up the work and pile up your expenses.

The necessity of adequate maintenance is so important that it should be a major concern for every equipment owner. Many owners feel that maintenance work should be part of the operator's job. While this may be true, particularly on jobs not large enough to justify a master mechanic or special maintenance man, the owner should not simply assume that the operator is "taking care of things." The owner should insist on a regular maintenance program and also should see that he gets periodic reports on the condition of his equipment.

In addition, it is important to realize that good maintenance requires more time than the operator can grab at odd moments on the job. The operating schedule should be arranged to provide adequate and regular times for inspection and minor repairs. It may seem that such a system cuts into the profitable operating time. In the long run, of course, there's far more profit in keeping your equipment in tip top shape all the time.

This profit does not come entirely from the low cost output a well-cared-for machine delivers. Smooth-running, clean-looking equipment has a definite advertising value which helps many contractors to get jobs. Good equipment inspires confidence in the contractor's ability to handle work competently. It has the further value of keeping the contractor's organization, or the quarry owner's, on its toes. Men take pride in working with good "tools," and they keep humping to meet the challenge of the capacity of their equipment.

How to Tell Your Equipment Condition?

As an owner, you can tell whether your equipment is skillfully operated and in good condition, even if you aren't an expert in the details of construction and operation. Take, for example, a shovel. There are four fundamental operations in the handling of a shovel. These are: Hoist; Swing; Crowd; Travel.

You can tell, even from a distance whether the hoisting is done with full power, without slipping. If the operator does not hesitate to heap the dipper speedily, you know he is not worried about power, or transmission of that power from source to the dipper. If he operates the hoist levers and brake easily, then they, and the parts they operate are in correct adjustment. If he "fights" the levers, something is wrong.

In swinging, the dipper should start smoothly, accelerate evenly and stop smoothly and accurately in dumping position. Since 60 per cent of a shovel's operating time is taken in swinging, this is a vital part of the digging cycle.

Crowding and retracting likewise give indications of skillful performance made possible by the condition of the machine. The condition of the travel mechanism is indicated by the answers to these questions: Does the machine proceed up reasonable grades without hesitation? Does it travel in a straight line? Does it steer equally well to right or left? Does it operate equally well forward and in reverse? Does it stand still during digging?

As outlined above, the owner can get a good general idea of the condition of his shovels. Much the

• Equipment that is kept in top shape both as to appearance and mechanical condition not only performs profitably, but is an incentive to men on the job to keep on their toes. In addition, well kept, smooth running equipment has a definite advertising value to its owner.

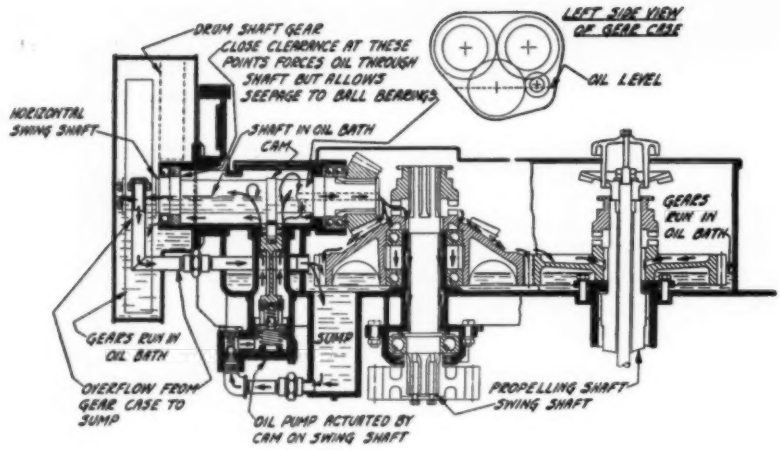

DRUM SHAFT GEAR
CLOSE CLEARANCE AT THESE POINTS FORCES OIL THROUGH SHAFT BUT ALLOWS SEEPAGE TO BALL BEARINGS
LEFT SIDE VIEW OF GEAR CASE
OIL LEVEL
HORIZONTAL SWING SHAFT
SHAFT IN OIL BATH CAM
GEARS RUN IN OIL BATH
GEARS RUN IN OIL BATH
SUMP
OVERFLOW FROM GEAR CASE TO SUMP
OIL PUMP ACTUATED BY CAM ON SWING SHAFT
PROPELLING SHAFT
SWING SHAFT

DIAGRAM OF CONTINUOUS FLOOD OIL LUBRICATION OF GEARS AND BEARINGS FOR SWING AND PROPELLING MACHINERY AND DRUM SHAFT GEARS ON REVOLVING FRAME (PROPELLING SHAFT SWING 90° FOR PURPOSE OF ILLUSTRATION)

• **Thorough knowledge of "what makes the wheels go 'round" helps the operator in doing necessary maintenance in the minimum time. This diagram shows lubrication system for a ⅜-yard shovel.**

same procedure can be followed for other excavating equipment. Of course such a test is superficial, and nothing on which to base maintenance plans. It should be supplemented by a regular report from the operator. In simple form, such a report might give the following information:

1—Has the machine been serviced regularly in accordance with manufacturer's recommendations?
Remarks—

2—What adjustments need to be made?
Remarks—

3—Do any parts need replacing now? In the next 30 days?
Remarks—

4—Is there anything that can be done to make the machine more efficient?

Such a report might well be a part of an itemized check sheet showing actual condition of all parts of the machine. This check sheet should be filled out and given to the owner at regular intervals. If such a procedure is followed, it is possible to figure in advance the probable cost of repairs. The operating schedule can be planned to provide time to make necessary repairs. Parts can be ordered ahead so as to be on hand when needed.

Follow Your System Regularly

The advantages of some such system are obvious. The details of the system best fitted for your particular job are variable and will depend on the type of work you are doing and the conditions under which that work is being done. The important thing is to have **some** system, and to follow it regularly.

Incidentally, most systems lose some of their value through constant use. This is due partly to human nature, and partly to changing job conditions. It is a good idea to change the system as often as necessary to keep it alive and functioning.

In setting up any system, your operator should play a big part. He is the most logical one to adapt a general system to the machine and job which he knows. If your operator knows you understand that maintenance cost is just as much a part of operating cost as fuel or cable expense, and if you cooperate in setting a definite time for maintenance work, your operator can go a long way toward keeping output up and maintenance costs down.

The general features of a maintenance system as outlined here can be fitted in to your particular needs.

Inspection Lays the Foundation

All maintenance, of course, depends on regular inspection. Beyond that, the main features are lubrication, adjustments and replacement of worn parts. A record of past work and future recommendations, as previously suggested, is invaluable in working out your system.

In setting up and following any system, it is well to keep in mind the purpose. It does little good to discover a part out of adjustment, and to fix it—unless the cause for the maladjustment is also determined. Replacing parts which have worn out prematurely is little help unless the cause of the undue wear is removed.

One of the secrets of successful maintenance lies in the ability of the operator to follow each operation of his machine from the power plant to the place where the work is being done. If he thinks of his various operations in this way, it is easy to know what is at the bottom of any difficulty. Knowledge of the "train" of parts used in hoisting, crowding, swinging and traveling should help insure complete checking of the parts involved in these functions.

The accompanying check sheet, drawn up for a shovel, may serve as a sample which you can use in building up your own sheets. A record such as this is a handy way to keep maintenance information. The history of a machine can readily be traced by a series of such sheets. They offer information in concise, easily understood form.

Check sheets for other equipment should not be difficult to draw up. Manufacturers will be glad to help you with points which should be checked on their machines. They naturally have an interest in the successful operation of the equipment you have bought from them.

But after all, you—and your pocketbook—are the chief gainers from adequate maintenance. And the savings you can make are well worth the time and effort required to build a good maintenance system.

• **On the opposite page is a sample check-sheet which might be used in shovel maintenance work. Additional points, or changes, should be made to fit this sheet to your own needs. Similar check sheets can easily be developed for other equipment.**

Suggested Check Sheet

Machine No..... Date.....

1. Has machine been serviced regularly with chart?.....
.....
2. Are there any adjustments that should be made?.....
.....
3. Are there any parts that need replacing?.....
.....
4. Is there anything that can be done to make machine more efficient?.....
.....

INSPECTION

Power plant

Oil consumption—(how much) _____
Fuel consumption—(how much) _____
Compression—(good or poor) _____ Valve clearance? _____
Ignition—(plugs, ign. pts.) _____
Carburetor—(clean) _____
Cooling system—(leaks, circulation, fan belt) _____
Master clutch—(does it slip, does it release) _____
Transmission _____

Drums

Do drums run true? _____
Are friction surfaces smooth? _____
Are clutch bands clean? Do they slip? Do they release? _____
Are brake bands clean? Do they slip? Do they release? _____
Drum shaft_____ Bearings_____

Swings

Are friction surfaces smooth? _____
Are clutch bands clean? _____
Extent of wear of lining? _____
Do swings grab? _____
Do swings work hard? _____
Gears _____Shafts _____Bearings _____

Travel

Does machine steer equally well to right or left? _____
Does holding device keep machine stationary while digging? _____
Does it work hard? _____
Drive chains—(tight or loose) _____
Tracks—(tight or loose) _____
extent of wear? _____
Gears _____Shafts _____Bearings _____

Boom

Condition of suspension cable? _____
Do point sheaves run true? _____
Check carefully gantry or A frame _____
Are there any cracks? _____

Sticks

Do dipper sticks run freely and true? _____
Are saddlelocks correctly adjusted? _____
Extent of wear? _____
Are there any cracks? _____

Bucket

Are teeth of correct length, and sharp? _____
Hoisting tackle _____
Are there any cracks? _____

EXCAVATING ENGINEER

A Monthly Publication
Devoted to the Excavating Industry

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Public Construction On the Rise

Public and institutional buildings have again become an important factor in the rising building market, according to F. W. Dodge Corporation. During the month of October, contracts were awarded in the 37 Eastern States for $89,839,000 worth of buildings in these classifications, their largest volume since December, 1935. Compared with the total for October 1937, which was $35,-085,000, last month's increase was nearly 156 per cent. These classifications include educational buildings, hospitals and institutions, public administrative buildings, social and recreational projects, and religious and memorial buildings.

Recent renewed activity in these classes of non-residential buildings, stimulated by the current PWA program, brought the total of contracts let for such projects during the first ten months of 1938 up to $502,407,-000, compared with $423,117,000, in the corresponding period of last year, an increase of 19 per cent. The dollar volume of contracts for hospitals and institutions has run 35 per cent ahead of last year; social and recreational projects have run 27 per cent ahead; educational buildings, 26 per cent ahead. Contracts for public administrative buildings (post offices, city and town halls, fire and police stations, and the like) have lagged 7 per cent behind 1937, and religious and memorial buildings, which are largely financed by private subscriptions, have lagged 2 per cent behind. In the total of publicly financed non-residential construction for which contracts were let in the first ten months of 1938, 32 per cent has been for buildings and 68 per cent for heavy engineering construction.

Continued increase in contracts for public non-residential building contracts is indicated for some months to come. From January through October, the Dodge organization has reported contemplated projects in these classifications to the amount of $1,667,-000,000, or three times the volume of contracts awarded during the same period, and more than double the volume of contemplated projects reported during the first ten months of 1937. The volume of new plans customarily increases when a new Federal works program is announced. A large proportion of them represent needed, but postponed projects.

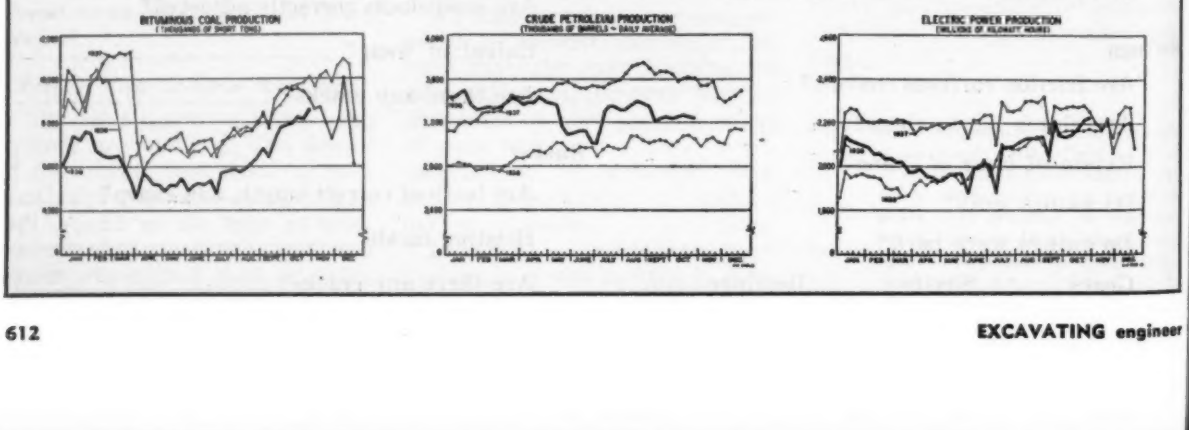
Do You Want Copies of "Who Owns Business?"

The editorial on the next page, is the fifth in a series of 12 articles explaining the American business system. Excavating Engineer is presenting the series, which is adapted from Bulletins issued by S. D. Warren Company, because they tell the story of our system simply and clearly. Reprints are available if you wish them to distribute to your employees.

You can get reprints by simply sending us one cent apiece for each copy of the reprint you want. (Minimum order is 10 copies).

Reprints of the four articles published are available at the same nominal price. Articles still to be published include: "Who Sets Prices?"; and "Who Determines the Wages of Employees?". If you want reprints of the entire series of 12 articles we will gladly reserve them for you, send those already published to you promptly, and follow with the others as they are published. Just tell us how many copies of each article you want, and enclose check or money order to cover the total at one cent each.

Weekly Business Indicators



Who Owns Business?

When we read about big business men, we assume they are the fellows who own the big businesses. Some of them do, but they are exceptions. Henry Ford is one of the exceptions because, along with his son, he owns his own business.

Most of the big business men are only the managers of their businesses, because the ownership of the big businesses is divided up among many thousands of people.

Six hundred and forty two thousand people own the American Telephone and Telegraph Company. Three hundred and fifty thousand people own General Motors Corporation. Altogether, twelve million people in the United States hold stock in some business and, therefore, own part of that business. A large proportion of those owners are people like yourself—people who are working on a job, getting paid, saving a little money and then using the savings to buy a part of some important business. Four classes of people own the big businesses of the country. These are:

1. Employed persons who receive regular wages and invest their savings in stocks.

2. Managers of businesses who invest savings in stocks of other businesses so as not to have all their eggs in one basket.

3. Unemployed persons, widows, aged people and the like, who have invested their savings or insurance money in stocks and bonds and who depend for livelihood on the success of the businesses in which their nest-eggs are invested.

4. Institutions, such as churches and colleges, which invest their money in stocks and bonds in order to make enough money to operate.

The 642,000 owners of American Telephone and Telegraph Company are scattered throughout America. Some own many shares of stock, some only a few, but every man who owns one share of stock is a business man because he is putting up his money to make a job for somebody else and to earn a profit for himself.

Now if American Telephone and Telegraph Company doesn't make any profit and therefore stops paying dividends, what happens? Dividend payments to 642,000 people are cut off. They don't get the profit that they expected to get when they invested money in A. T. & T. stock. If they have only a few shares of stock, their losses are comparatively small, but they may be pretty important. Everybody who has money invested feels the loss to some extent.

Say, for example, that an excavating truck driver, working for a salary, bought a few shares of General Motors stock and became one of the 350,000 stockholders, or business men, interested in this big corporation. If business is good and General Motors makes money, owners of stock—all 350,000 of them —will get more in dividends, and the truck driver will have extra money to put into a savings bank, to buy insurance, to invest in a trucking business or to invest in some other stock to earn additional money.

If business in general is good, twelve million people who own all kinds of stock will get dividends from the money they have invested. They will spend some of it to buy things and thus make business better. They will invest some of it and thereby help to make more jobs. When folks are working every day and business is good, the majority of families will put something in the bank for a rainy day, and that will mean more money for the banks to lend out to business, which in turn will make more work and more of everything for everybody.

If anything happens that destroys the profit of American Telephone and Telegram, General Motors, General Electric and other companies, the consequences are very serious for everybody. People who expect dividends but don't get them will not have that money to spend, nor to reinvest in other businesses. Furthermore, they will decide that they had better spend a little less of their wages and save more. As a result, the grocer's business falls off, the clothing store does a poor business and so the food manufacturers and the clothing manufacturers lay off men or work a short week.

When little business falls off, big business also falls off because all business is dependent on all other businesses. When the sales of the druggists and the butchers drop off badly, the drug manufacturer and the packing house go on short time, their employees stop buying automobiles and the automobile plants go on short time. Then the drug manufacturer, the automobile manufacturer and the packing house stop buying labels and booklets, and orders for Cumberland Mills drop off so that there isn't enough work to run the mill.

When harm comes to big business in America, everybody in America suffers. The hundreds of thousands of American people who share ownership of big business lose money and the loss of that money cuts down employment and wages in all businesses.

Equipment you ought to KNOW ABOUT

Snow Sweepers

The Hough Tractor Snow Sweeper, made for use with nearly all makes of industrial wheeled tractors, is finding favor with town and city officials because of the simplicity with which these units clean snow from sidewalks, driveways, city streets and parkways.

Too, because of the ease of attachment to any industrial wheeled tractor, their low cost and flexibility of operation, the maker

states that these high speed snow removal units are available to parks, cemeteries, ice skating rinks, large industrial plants and other users requiring an inexpensive unit for short-time or all-day snow sweeping. A tu-way model is also featured that will sweep to either left or right with instant change of direction.

D-C Arc Welder

A new 150-ampere, direct-current, single-operator arc-welding equipment has been announced by General Electric. The manufacturer claims this new equipment, because of its high, instantaneous recovery of voltage, prevents arc popouts at all points in its wide welding range with any good bare, lightly coated, or heavily coated electrode.

Any welding current within its entire range can be quickly obtained by means of a three-point selector switch and an easily operated dial for intermediate adjustment. Isothermic overload protection permits the equipment to carry maximum safe overloads without danger of burnouts and without unnecessary interruptions on harmless overloads. The new d-c equipment is rated 150 amperes at 25 volts and its range of adjustments varies from 20 to 200 amperes at 25 volts.

Large Capacity Pump

The Bingham Pump Company, Portland, Oregon, announced the manufacture of a new type, large capacity, low head pump. The company has just completed work on three pumps designed to deliver 35,000 gallons per minute. Each pump will be powered by a 500 horsepower electric motor. It is claimed that this is the first time in the history of the pump industry that propellor type pumps delivering large quantities of water to comparatively high heads are being offered.

New Gasoline Tractor

A new gasoline tractor, the Model "S," has been announced by Allis-Chalmers Manufacturing Company. This machine develops 77.66 horsepower on the belt, 64.52 horsepower at the drawbar and 16,732 pounds drawbar pull in first gear. The constant mesh transmission provides five forward

speeds from 1.52 to 6.37 miles per hour, and the constant mesh feature makes it possible to shift "on the go" like a truck. The tractor is offered in two tread widths. The 62 inch tread model has a shipping weight of 18,200 pounds while the 74 inch tread machine weighs 19,000 pounds. A new four cylinder valve-in-head gasoline engine has been developed by Allis-Chalmers for the Model "S." The bore is 5¾ inches, the stroke 6½ inches, and the governed speed at full load is 1,050 R.P.M. The Model "S" is suited for snowplow work, for 7 to 8 yard scrapers, 12 foot blade graders, 10 yard wagons, bulldozers, trail-builders, winches, logging arches, or other auxiliary equipment and makes gasoline tractor power in the 65 horsepower class available for the first time to contractors and public bodies alike.

3½-S Tilting Mixer

The new 3½-S Tilting Mixer recently designed and built by the Ransome Concrete Machinery Company, Dunellen, New Jersey, incorporates many new features which the company claims will produce the maximum mixing efficiency and speed at a new low minimum cost and result in more dollars earned by the contractor.

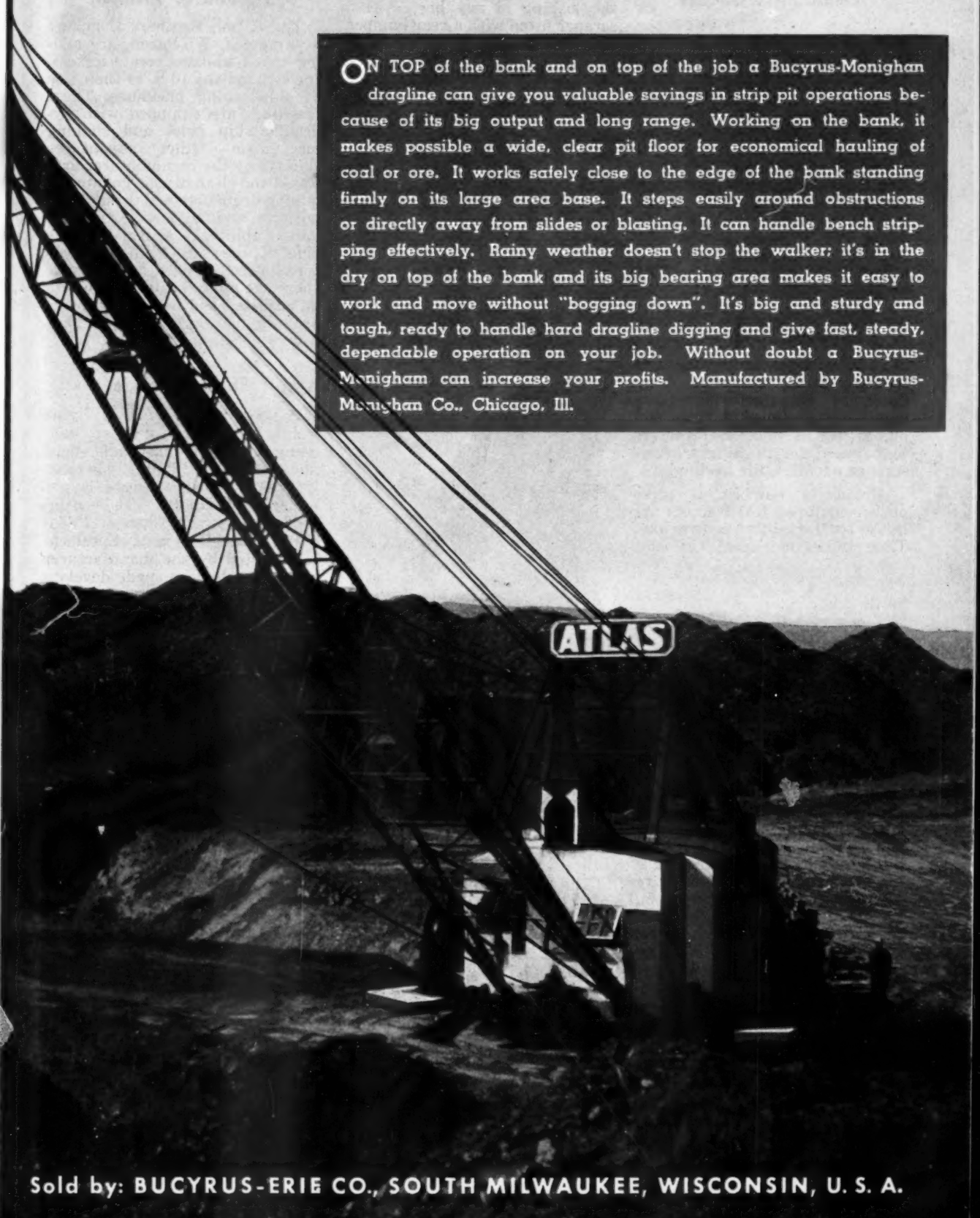
Extra strength has been built into the mixer due to welded details and lighter weight has been achieved through use of a new pressed unbreakable steel bowl.

The drum can be easily tilted to either side for charging or discharging by means of a large hand wheel operating through a large

(Continued on Page 618)

MONIGHAN

ON TOP of the bank and on top of the job a Bucyrus-Monighan dragline can give you valuable savings in strip pit operations because of its big output and long range. Working on the bank, it makes possible a wide, clear pit floor for economical hauling of coal or ore. It works safely close to the edge of the bank standing firmly on its large area base. It steps easily around obstructions or directly away from slides or blasting. It can handle bench stripping effectively. Rainy weather doesn't stop the walker; it's in the dry on top of the bank and its big bearing area makes it easy to work and move without "bogging down". It's big and sturdy and tough, ready to handle hard dragline digging and give fast, steady, dependable operation on your job. Without doubt a Bucyrus-Monigham can increase your profits. Manufactured by Bucyrus-Monighan Co., Chicago, Ill.



Sold by: BUCYRUS-ERIE CO., SOUTH MILWAUKEE, WISCONSIN, U. S. A.

Equipment You Ought to Know About

(Continued from page 614)

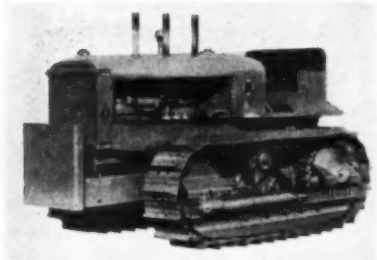
reducing gear. Both the gear and the easy operating friction brake which locks the drum in any position are fully enclosed to prevent accidents.

For high speed traveling over all types of roads, the mixer is mounted on a trailer body with long leaf spring mounted axles, and pneumatic tired wheels equipped with roller bearings. The mixer can be easily moved into position by one man by means of a large handling bale which slides under the mixer out of the way.

Pusher Tractor

To increase scraper yardage and reduce loading time, the Allis-Chalmers Manufacturing Company, has designed a front-end bumper for its Model L-O tractors to be used for pushing tractor-scraper outfits while loading.

Already a number of these pusher-equipped L-O tractors are in use by Midwestern contractors. Time studies on several jobs show



they increase payloads two and three cubic yards per trip, cut loading time in half and raise the daily output per scraper from a third to half. Users figure use of the pusher will reduce tractor repair costs materially by relieving the pulling tractors of much of the twisting and jerking strains customary to loading. One pusher tractor can handle from three to five tractors and scrapers depending on the length of haul.

The Allis-Chalmers bumper is spring cushioned and mounted inside the truck frames in such a manner that the push is on the rear end of the tractor. The bumper has a face, 36" by 32", so contact with the scraper bumper can be made easily and quickly without shock. Though designed primarily for use with Gar Wood scrapers, Allis-Chalmers bumper equipped tractors can be used for the loading of any big capacity scraper fitted with a rear bumper.

Dust Samplers

Two new instruments for dust sampling have been announced by the Mine Safety Appliances Company. The M. S. A. Midget Impinger is the latest development in dust sampling apparatus employing the accurate impinger method. It weighs less than 10 pounds and provides convenient portability with easy hand operation.

The other, the M. S. A. Electrostatic Dust and Fume Sampler is designed for quantitative sampling, and employs the principle of pre-ionization with electrostatic precipitation. Separate bulletins of these instruments can be obtained by writing to the company at Braddock. Thomas and Meade Streets, Pittsburgh, Pennsylvania.

Portable Gasoline Drill

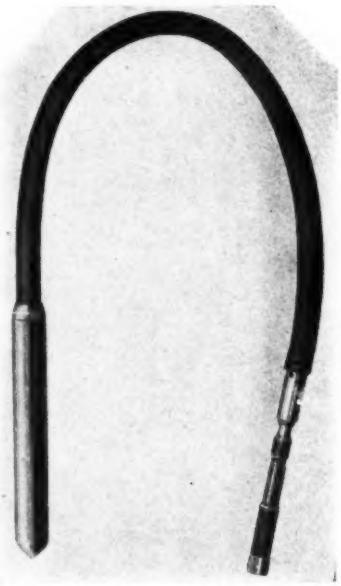
The Barco Manufacturing Company of Chicago, Illinois, announce full time production on their new designed, self-powered, instantly portable driller known as the "Barco J-2." This machine, not an accessory as was the former drilling equipment for the Barco Hammer, is a driller, pure and simple, incorporating the drill-turning mechanism directly in the base of the power unit. Its light weight, enabling the operator to carry it to most inaccessible jobs as well as its instant readiness for work under its own power, meets the requirements of road contractors and construction engineers.

7-S and 10-S Mixer

The Gilson Brothers Company of Fredonia, Wisconsin, are adding two 4-wheel concrete mixers, the 7-S and the 10-S, to their line of side-loading machines. These machines are equipped with hydraulic skip hoist and shaking mechanism. Other advantages claimed by the manufacturer are: Rapid and clean discharge into the mixing drum obtained through the positive and adjustable shaking valve; ability to shovel into the side of the skip without interference from cables; and, because there are no brakes or clutches to be adjusted and because all parts are well guarded, the machine has a greater safety element.

Shimmy Spade

A small diameter (2½"), lightweight vibrator for fast, economical use in thin walls, floor and roof slabs, columns, pile casting, etc., where concrete is not under 3" slump has just been introduced by the Chicago Pneumatic Tool Company. Specifications listed by the manufacturer show the shimmy spade develops 9,000 V.P.M., has a capacity of 15 to 20 cubic yards per hour, is recommended for operating at 90 to 100 pounds of pressure.



He Jes' Keeps Rollin' Along

And the shovel will keep moving along when Hercomite and Gelamite do the blasting. These modern, economical explosives break the material properly. Breakdowns of equipment are less frequent — bulldozing and lost time are reduced. Grades and strengths for every job.

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Shots from the FIRING LINE

Diversion Trend Reversal?

Definite reversal in the tendency of state legislatures to divert highway funds to non-highway purposes is revealed by the 1937 reports of state highway incomes and expenditures published by the United States Bureau of Public Roads.

The reports indicate that in 1937 there was no diversion whatsoever in 14 states, all revenue from special additional highway taxes being dedicated to roads, that nine states reduced diversion substantially, and that two states abandoned the policy.

Contributing further to optimism that the income from special additional taxes paid by highway users specifically for highway financing will be used exclusively for that purpose, with the possibility that taxes may be reduced as road programs approach completion, are news reports that referendums on anti-diversion amendments will be held in four states at the coming November elections.

Approval of these proposed amendments in California, Michigan, New Hampshire, and Alabama would provide their motorist taxpayers with the same safeguards for highway funds and development now established by existing amendments in Missouri, Minnesota, Kansas, and Colorado, and by statute in Maine. The legislatures of Indiana and Nevada have approved anti-diversion referendums.

New York, which has been diverting a large proportion of its highway tax revenues in an effort to pay off state indebtedness of around $100,000,000, reduced its diversions nearly by $20,000,000 in 1937. Connecticut and Maryland abandoned the policy of diversion, while reductions were recorded in Indiana, Michigan, Nebraska, North Carolina, Oklahoma, Oregon, South Dakota, and Tennessee.

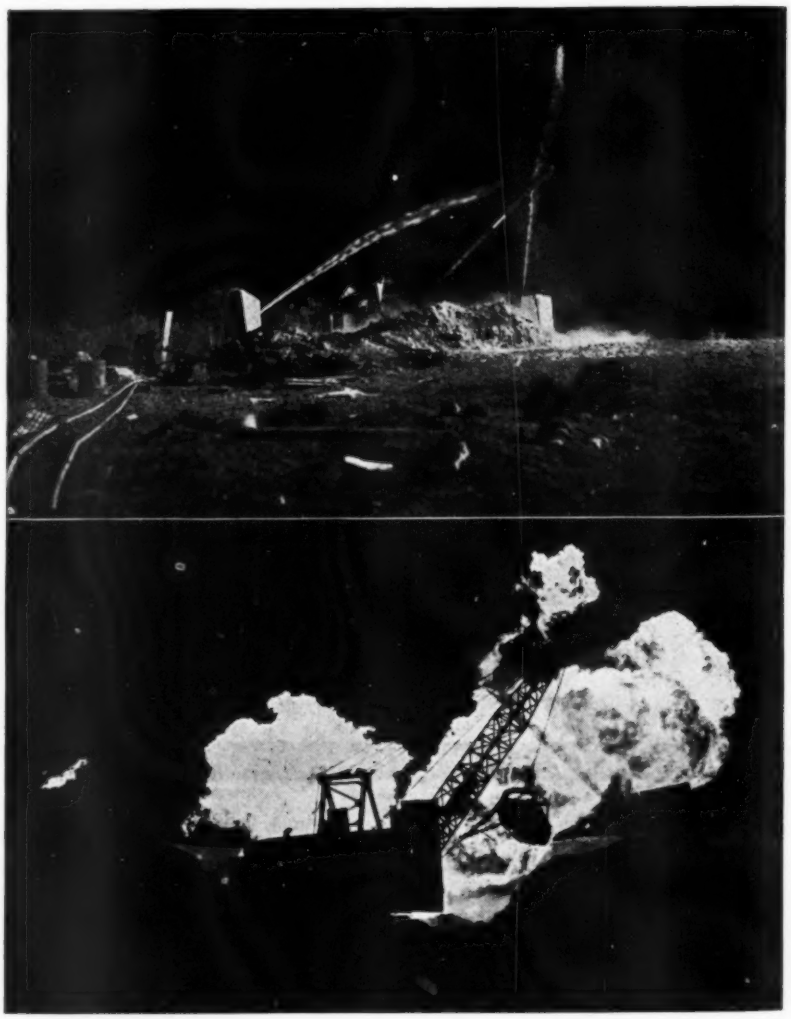
Sentiment against the misuse for general purposes of special tax funds collected for and supposedly dedicated to highway financing has been growing, having been accelerated especially by public disatisfaction with the resulting neglect of highway maintenance, and even of construction. The practice has been denounced by Congressional committees, by many public officials, and by newspapers and magazines like Excavating Engineer, and some state legislatures have been put in the peculiar position of promoting highway safety and tourist travel on one hand and on the other curtailing highway development essential to both by diverting road funds to non-highway purposes. In many cases road funds have been depleted to such an extent that highway users were asked to pay additional taxes to finance roads for which already they had paid. In other cases state highway funds have been so diminished that states have been unable to match federal highway aid grants, and thus have lost the benefit not only of roads which could have been built with state road tax revenues, but those which would have been built with federal funds.

Total state highway fund diversions for 1937 were reported by the Bureau as nearly $9,000,000 below those of 1936. Actual diversions in 1937, however, amounted to $161,413,000, or 13.7 per cent of the $1,177,827,000 paid in special additional taxes for highways by highway users.

Excavation for Shasta Dam Gets Under Way

A new bed is being prepared for the Sacramento River at the Shasta Dam site where 1,250 men are at work for the United States Bureau of Reclamation and three contractors on various phases of early construction.

Excavation is well under way for a temporary diversion channel which will



• **Top: Protected by shields of galvanized iron, and streams of water, a Bucyrus-Erie ⅜-yard dragline salvages machinery from the crater of a blazing oil well. Bottom: At the same blaze, a Northwest dragline digs a runway to the crater base.**

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DIESEL ENGINE LUBRICATING OIL

A truly modern oil that does more than lubricate perfectly

On construction jobs, in power plants, in the woods and on the farm, "RPM" Diesel Engine Lubricating Oil is helping Diesel tractor owners to earn more profits.

It is made to prevent ring-sticking, reduce non-operating hours and end overhauls for carbon removal. When drained it removes dirt and carbon which it holds in suspension.

If your equipment is "Caterpillar" Diesel, this is *your* oil. "RPM" Diesel Engine Lubricating Oil is distributed by the following companies under the brand names indicated:

IN THE UNITED STATES

"RPM" Diesel Engine Lubricating Oil:
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THE CARTER OIL COMPANY, Tulsa, Oklahoma
HUMBLE OIL & REFINING COMPANY
STANDARD OIL COMPANY (Indiana)
STANDARD OIL COMPANY (Inc. in Kentucky)
STANDARD OIL COMPANY (Nebraska)
STANDARD OIL COMPANY OF CALIFORNIA
STANDARD OIL COMPANY OF TEXAS
UTAH OIL REFINING COMPANY

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STANDARD OIL COMPANY OF PENNSYLVANIA

Signal "RPM" Diesel Engine Lubricating Oil:
SIGNAL OIL COMPANY

Sohio "RPM" Diesel Engine Lubricating Oil:
THE STANDARD OIL COMPANY (Ohio)

IN CANADA

"RPM" Diesel Engine Lubricating Oil:
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Get in touch with your nearest distributor—for a clean engine, and long hard service with the minimum of overhaul.

WORLD-WIDE ACCEPTANCE

extend 2,000 feet along the east side of the present river channel, opposite the 1,820-foot railroad by-pass tunnel being bored through the west abutment of the dam site.

Frank T. Crowe, superintendent for the general contractor, reported to Construction Engineer Ralph Lowry that the diversion channel will be completed by Spring, ready to carry the 1939 low flow of the river past the dam site, thereby permitting the first concrete to be placed in the base of Shasta Dam next Summer.

When the seasonal peak of the river has subsided in the Spring, small cofferdams will be built both upstream and downstream from the dam site, to turn the river into the diversion channel and "un-water" a quarter of a mile of the present channel. It is planned that excavation for the base of the dam can be completed and some concrete poured in the lowest portion in the river channel before high water comes again in the late Fall of 1939. At that time the river will be turned out of the temporary diversion channel and permitted to flow over the low blocks of concrete in the dam.

Mr. Lowry said that to prevent Winter flooding of the existing Southern Pacific railroad up the Sacramento River Canyon, which still will be used by trains until 1941, concrete in the central section of the dam may be raised only to the approximate level of the present river bed.

Meantime, excavation and placing of concrete may proceed on the abutments of the dam. Mr. Lowry said when the permanent 30-mile railroad relocation is completed and opened to traffic around the Shasta Reservoir area, the temporary by-pass tunnel at the dam site will be available for river diversion, and concrete thereafter may be raised in the central portion of the dam.

The diversion channel is being cut mostly out of rock, with a five-yard shovel feeding a fleet of six 20-yard dump trucks. The channel will be 50 feet wide and is designed to carry 10,000 second-feet of water at a depth of 12 feet. The channel requires 112,000 cubic yards of excavation. A rock dike will form the west or outside wall for a distance of 900 feet at the downstream end.

Superintendent Crowe said the general contractor, Pacific Constructors, Inc., plans to handle the entire dam excavation with electric shovels and dump trucks. The company has ordered a fleet of 18 huge trucks, with 25-yard capacity bodies, to be equipped with 150-horsepower butane motors. Each truck will carry almost half the normal load of an ordinary gondola railroad car.

Excavation is under way now on both the east and west abutments. Construction of the general contractor's camp is progressing rapidly in the canyon below the dam site, and the office building already is occupied. Concrete piers have been poured for a 512-foot railroad and truck bridge across the river immediately below the dam site, and the steel superstructure is being erected.

Driving of the by-pass tunnel, under contract with the Colonial Construction Company, has progressed about 350 feet into the south heading and 75 feet into the north heading. At each end, crown drifts are being extended ahead of the main bore before the tunnel is excavated to its full vertical height of about 26 feet.

Award of two contracts totaling $1,717,361.90 for the construction of earthwork, tunnels and structures on 14 miles of the Southern Pacific Railroad relocation, between Redding and Delta, Kennett Division, Central Valley project, California, was announced recently. The two successful bidders being the lowest of thirty-two proposals.

Granfield, Farrar and Carlin of San Francisco, California, were the successful bidders for schedules 1, 2, 3, and 4 on their bid of $812,380.90 for constructing the roadbed, culverts, drains and highway crossings on 12½ miles of the relocation.

The West Construction Company of Monrovia, California, was awarded the contract for schedule No. 5 on its bid of $904,981 for constructing the roadbed, culverts, drains and two tunnels, 2,165 feet and 2,610 feet in length, on a 1½ mile section of the new line.

Batter for 205,000 Pancakes Made in Concrete Mixer

That's right, up in Winona, Minnesota, the demand for pancakes was actually so great that they had to make the batter in modern concrete mixer. The occasion was the second annual Pancake Day, sponsored by the Junior Chamber of Commerce of Winona—a three-day festival beginning on September 30, during which about 25,000 enthusiasts celebrate the bumper wheat crop which means prosperity for Winona, the center of a large wheat producing area. Aside from the various entertainments, games of chance, circuses and other means used to maintain interest in this jubilee, most notable feature of all is the practice of making gifts to all and sundry of pancakes made from Winona-milled flour.

But 25,000 people can eat quite a few pancakes—and they did, too—this year consuming over 205,000 of the golden brown flapjacks along with 160 gallons

Out Comes The Batter.

For your convenience in writing to Standard Oil Co., you will find a card bound in this issue.

of maple syrup and 600 lbs. of coffee.

Naturally, mixing enough batter to make 205,000 pancakes is quite a job. As a matter of fact, it means mixing more than two tons of flour and 400 gallons of milk, together with the many pounds of seasoning ingredients. But undaunted by this problem, the members of the Junior Chamber of Commerce called on their good friend, Harold E. Murtinger, contractor at Winona, who came to the rescue with his Rex 5-S mixer. Mr. Murtinger, the morning of the opening day of the celebration, towed his pneumatic-tired mixer to the proper location, showed the celebrators how to load, mix and discharge the batch, and let them go to work.

First Contract Awarded for Colorado-Big Thompson Project

The first contract for construction work on the Colorado-Big Thompson project, Colorado, has been awarded to the Warner Construction Company of Chicago, Illinois, on its bid of $4,226,-206.20. This bid was the lowest of five proposals received and opened at the Denver, Colorado, office of the Bureau of Reclamation. The contract covers both the building of the Green Mountain Dam and the Green Mountain Power Plant, located on the Blue River about 16 miles southeast of Kremmling, Colorado.

The Green Mountain Dam will be 270 feet high with a crest length of about 1,300 feet and a top width of 35 feet. It will be the second highest and largest earth and rock-fill dam in the United States. Only San Gabriel Dam No. 1 in California exceeds it.

Downstream from the dam the Green Mountain power plant will be located on the right bank of the Blue River. The powerhouse will be of reinforced concrete construction, 67 feet wide by 97 feet long, and will house two main generating units of 12,000-kilovolt-ampere each.

The dam and powerhouse are two of the principal construction features of the Colorado-Big Thompson project, which is designed to supply supplemental water for 615,000 acres of land on the Eastern Slope of the Continental Divide in Northeastern Colorado by diversion of surplus water from the headwaters of the Colorado River on the Western Slope. In order to protect the water users in the Colorado River Basin against depletion of their water supply by diversions through the Continental Divide Tunnel, the Green Mountain Dam will be constructed to provide replacement storage. The reservoir will be of 152,000 acre-feet capacity.

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Durability means long life. In Wire Rope it means the ability to resist the wear and tear that Wire Rope encounters in service.

"HERCULES" (Red-Strand) Wire Rope has maximum durability because the vital factors to produce long life are built into it in balanced proportion. Strength . . . toughness . . . elasticity and flexibility, all perfectly balanced in "HERCULES" (Red-Strand) produce that fifth vital characteristic of durability.

It is the presence of all the essential factors in every length of "HERCULES" (Red-Strand) Wire Rope that makes it perform better and last longer. Your own cost charts will show you how big the difference is.

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Award First Contract for South Penn Highway

Possessor of the first contract to be let on the $60,000,000 South Penn Highway is L. M. Hutchinson of Mt. Union. Mr. Hutchinson's bid of $458,000 for the construction of 10 miles of roadway was lowest of 27 bids received by the Pennsylvania Turnpike Commission for this portion of the Harrisburg-Pittsburgh superhighway.

The Commission has announced the purchase of the right-of-way of the old South Penn R.R., along which the road is being built, from the owners, the Pennsylvania and the Baltimore & Ohio railroads, for $2,000,000.

The highway is being financed by means of a PWA grant of $24,000,000 and the sale to RFC of $35,000,000 in bonds to be retired from toll charges. RFC has already sold a block of $10,-000,000 of the bonds to a New York bonding firm. The proposed schedule of tolls is $1.50 for passenger cars and light trucks, $4.00 for buses, and $2.00 to $10.00 for heavy trucks.

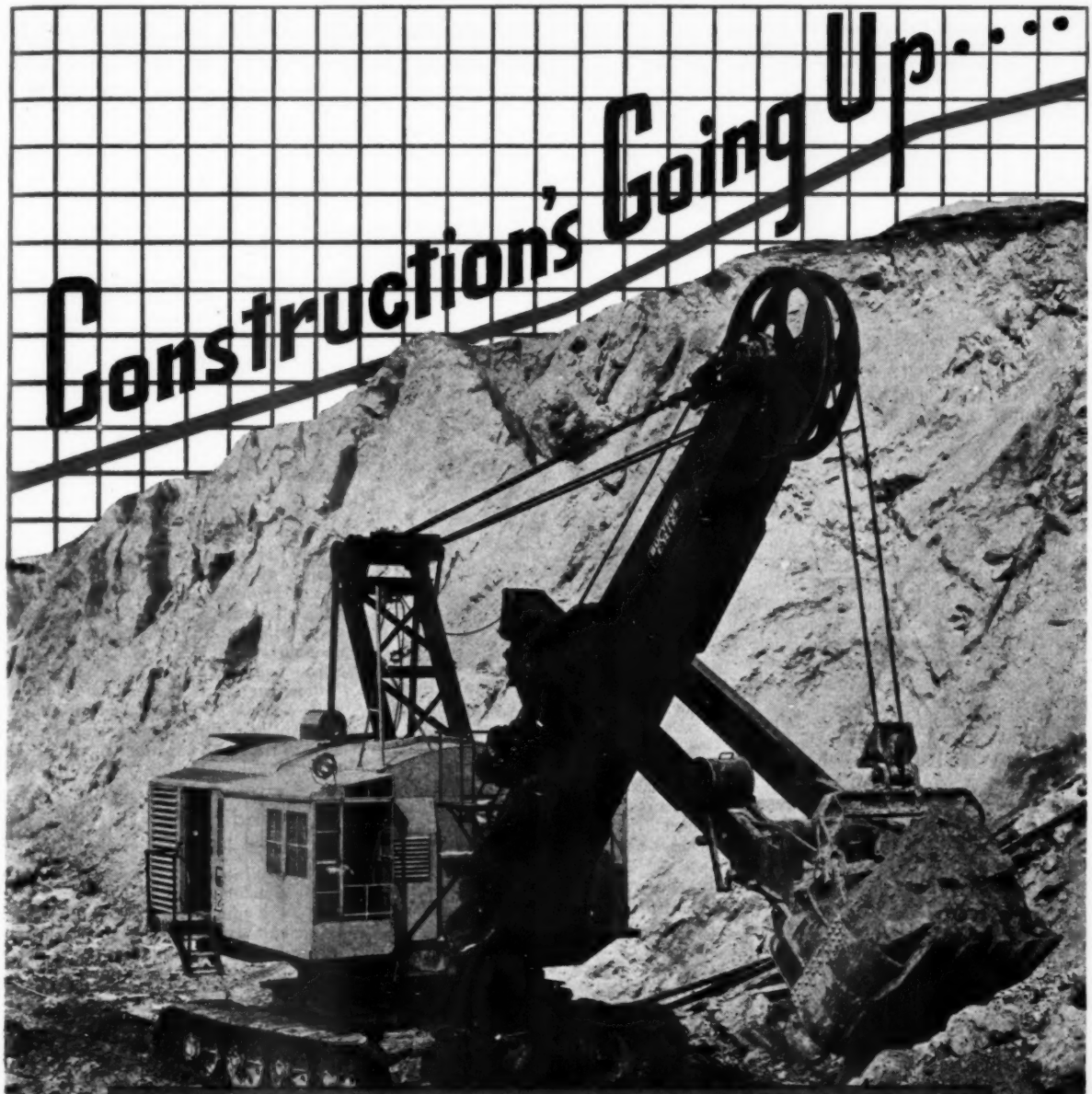
Award Gila Project Contract for Construction of Structures

Jahn and Bressi Construction Company, Inc., on its bid of $388,767.73, has been awarded contract for the construction of structures on the Gravity Main Canal, Gila project, Arizona.

Under the contract the company will furnish labor, materials, and perform all work for the construction of structures

For your convenience in writing to A. Leschen & Sons, you will find a card bound in this issue.

Construction's Going Up . . .



NOW is the best time to consider modernization of your quarry equipment. The emergency spending program to which the Federal Government is committed, the regular Federal-Aid highway program, and the recent steady gains in private construction only foreshadow the real boom in normal building and construction which is ahead.

If you are in a position to swing into big production at today's low costs, you will be able to make the most of the coming up-swing *the moment it breaks.* You may not want to buy new equipment now, but you will be wise to plan modernization so you can go ahead without costly delay.

Bucyrus-Erie offers you the most complete modern line of big-output quarry machines available. It will pay you to get ready to profit from the up-swing by considering the Bucyrus-Erie machine best fitted for your needs, and by figuring the actual low-cost, high-volume loading you can get with these "Years Ahead" excavators.

Plan now and profit tomorrow!

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

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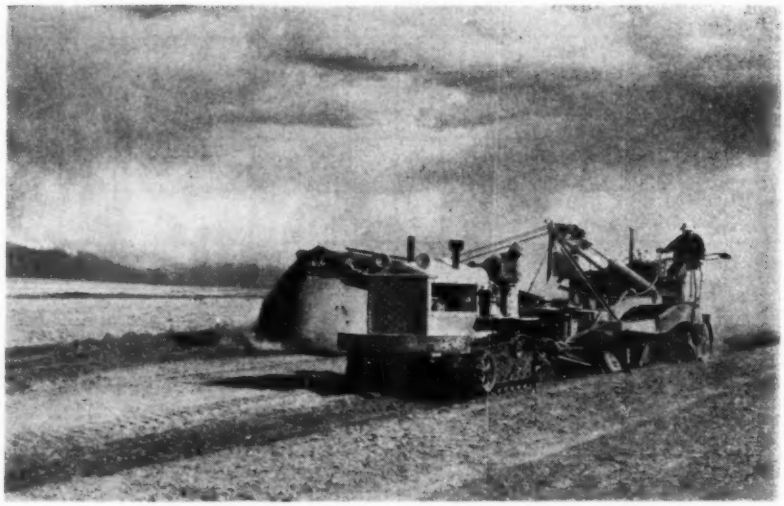


● Driscoll Construction Company of Pueblo, Colorado, builds a new road between Saguache and Salida. In stony soil this Cletrac tractor and elevating grader cover about one mile an hour.

on about 18 miles of the Gravity Main Canal located about 15 miles northeast to 10 miles east of Yuma, Arizona. The structures include drainage inlets, overchutes, automatic spillways, check drops, weir drops, turnouts, wasteways, and the excavation for the Fortuna Wash siphon. The contractor is given 450 calendar days to complete the work.

The Main Canal will carry water diverted from the Arizona side of the Imperial Dam by gravity around the north and west side of the Laguna Mountains.

Announce Convention Dates

The National Sand and Gravel Association and the National Ready Mixed Concrete Association will hold joint annual conventions and a joint exposition at the Netherland Plaza Hotel, Cincinnati, Ohio, on January 25, 26 and 27, 1939. It will be the twenty-third annual convention and exposition of the National Sand and Gravel Association and the ninth annual convention and exposition of the National Ready Mixed Concrete Association.

During the week immediately following the aforementioned conventions, the National Crushed Stone Association will hold its convention at the same hotel. Dates for this meeting are January 30 through February 2, 1939.

8-Mile Contra Costa Bids Opened

Haas, Doughty & Jones and Marshall & Stacy, of San Francisco, was the low bidder on Schedule 1 of an additional 8-mile Contra Costa Canal Section, at $149,404.00 for construction of 2½ miles of canal, the 9,000-foot Los Medanos wasteway, and other appurtenant structures including two reinforced concrete siphons and two highway bridges.

Heafey-Moore Co. and Fredrickson & Watson Construction Co., of Oakland, submitted the low bid on Schedule 2 at $161,399.60 for construction of 5½ miles of canal and structures including two siphons and four highway bridges.

Haas, Doughty & Jones and Marshall & Stacy were low for the combined schedules at $315,526.50, followed by Heafey-Moore Co. and Fredrickson & Watson at $318,254.65. Both of these bidders stipulated they would accept only the combined schedules. Competition was keen and Walker R. Young, supervising engineer, said the result can not be determined until analysis of all bids is completed.

This section of the Contra Costa Canal, which is a unit of the Central Valley Project, will extend past Antioch and Pittsburg. The Los Medanos wasteway will be an emergency spillway channel leading from the canal to the San Joaquin River.

Construction is proceeding on the 8-mile section of canal between Oakley and Antioch, and all work is completed on the initial four-mile section from Rock Slough to Oakley.

Finding the Bumps

By JOHN R. MARCY

The desirability and need of an automatic machine that would locate and mark the minor surface irregularities in asphalt concrete pavement has been apparent for the past several years, particularly since the practice of cross rolling was started.

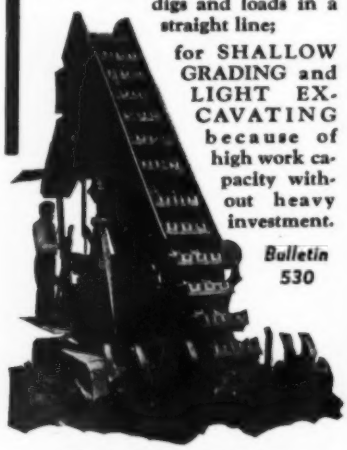
To meet this need, a device of simple construction and light weight called a "Bumpograph" has been designed by Resident Engineer E. L. Seitz, of the California Division of Highways. It consists of a frame hinged in the middle and supported by one wheel at each end, and two wheels at the middle hinge.

THE "EXCAVATOR"

for UNDERPASS, SUBWAY, ALLEY and OTHER CLOSE QUARTER WORK because it digs and loads in a straight line;

for SHALLOW GRADING and LIGHT EXCAVATING because of high work capacity without heavy investment.

Bulletin 530



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Long Range Digging AT LOWEST COST

On any work where materials have to be moved beyond the reach of a boom or dipper-stick, a Sauerman machine has an advantage over other equipment because it is able to dig, haul and place the material in a continuous, straightline operation, doing away with the expense of rehandling. For the complete evidence—

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Slackline and Pile of Rock Taken From Stream

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You've got me wrong—you pay them!

THE businessman pictured here is talking about taxes—government costs.

Is he complaining because he has to pay them?

Nope! He's complaining because he has to *collect*, or try to collect, most of them from *you*—in the prices charged *you*.

Businessmen are against mounting government costs because they increase taxes. The treasury has no money except what comes out of the taxpayers' pockets. More burden of costs heaped upon consumers and upon enterprise means lessened business operations and fewer jobs. The fewer employed, the heavier the taxes to support the rest.

The *whole people must pay* the increased cost of government—the wage and salary earner as well as the business partner, and the *man without a job*.

The businessman would sing a different tune if these taxes were necessary to care for the needy. He has a heart, too.

But the fact is—only $1 out of $6 actually is spent on account of the needy today.

A big share of government costs is represented by more than 3½ million government employes *not* on relief rolls—who man an army of bureaus, many of which grind out rules, regulations and edicts which affect not businessmen alone but farmers, wage earners and consumers. They are busy policing, prying, restricting—on *your* money.

If you want to see better times return on a sound basis—if you want to see employment increase, factories busy, retail stores full of customers—you have a vital interest in seeing the country cut loose from the ball and chain of excessive government costs.

That's another way of saying, it's about time to help business. *What helps business helps you!*

You Pay Hidden Taxes

Because the tax collector does not knock at the door it does not follow that no taxes are paid. For example:

The telephone bills paid in 1937 concealed an average of $9.91 in taxes.

One-sixth of the electric light bills went for taxes.

The sales slip for a cotton dress covered 125 taxes.

Fifty-two taxes were included in the price of a loaf of bread.

A pair of overalls carried 148 taxes.

• • •

Government costs equal $28 for every $100 of income (more in case of *earnings*) of every man, woman and child—$22 of which are current taxes, and $6 debts.

This message is published by

NATION'S BUSINESS

—a monthly magazine edited in Washington where business and politics meet. Established 1912. 315,000 business men and women subscribe. Begin reading Nation's Business now.

For your convenience in writing to the Nation's Business, you will find a card bound in this issue.

• At present, these half-dozen machines represent the available supply of "Bumpographs."

One end of the frame extends well beyond the middle and is utilized as the primary arm of a compound lever. This lever holds a crayon which bears against the pavement as the machine passes over a bump.

All springs and weights have been eliminated and the total weight of the whole is approximately 30 pounds. The hinged construction of the frame permits the machine to be folded so that it can easily be transported in an automobile.

Successful operation of the Bumpograph depends greatly upon maintaining the marking crayon at a fixed position in respect to the crayon holder, and considerable thought and effort was necessary to develop an automatic feed that would keep the crayon extended a certain distance beyond the holder as the crayon wore away. Several methods were tried, the most satisfactory of which was a worm feed. A rubber wheel about two inches in diameter is attached to the end of the crayon holder so that the tread of the wheel bears against the pavement surface when the crayon arm is lowered to marking position. Rotation of this wheel turns a feed screw which automatically keeps the crayon a fixed distance beyond the end of the holder and requires no attention except replacement of the chalk.

Several grades of crayon have been tried. Yellow lumber crayon, and mechanic's soap-stone crayon have been discarded in favor of railroad crayon, commonly called "car-whacker's" chalk. This leaves a heavy white mark which is plainly visible and does not fade out from the heat of the pavement.

The Bumpograph is positive in action and sufficiently sensitive to mark bumps 1/16 of an inch high over a length of five feet or less. By means of an adjusting screw on the arm, the height of a bump to be marked can be selected. Generally the adjustment is made so that bumps ⅛ inch high will be shown.

The machine has been successfully employed on a number of jobs in Southern California, and is rapidly coming into wider use.

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Built to Last . . . and Move Dirt Fast!

Williams Power-Arm Buckets in all types and capacities for all services, feature perfectly STRAIGHT CABLE LEADS.

●Williams Buckets stand up in service. They are ruggedly built of selected steels. Welding plays an important part in their construction to eliminate excess weight and provide greatest strength against shock and strain. Power mechanism is designed to develop tremendous digging power, and smooth, fast action. These buckets are scientifically designed throughout for maximum efficiency.

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Handy Hoist

Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool — easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes — ¾ ton, 1½ ton, 3 ton, 4½ ton, and 6 ton. Write for descriptive literature.

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough—that's why replacements and adjustments are less frequent.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.

New Bucyrus Oil Reclaimer

With the NEW Bucyrus Oil Reclaimer, used oil is reclaimed by a simple washing and filtering process at an average cost of about nine cents per gallon. It is a scientific fact, arrived at by leading research engineers and chemists throughout the country, that engine-use breaks down only the weaker and unstable molecules of your oil. These constitute about 10 per cent of the oil—the other 90 per cent, the strongest particles of the original oil, can be separated and cleaned for re-use by the NEW Bucyrus Oil Reclaimer.

Investigate the possibilities of the Bucyrus Oil Reclaimer before you discard another quart of used oil.

Wire Rope

Selected by the men who build your excavating and drilling machinery, Bucyrus-Erie rope has the special features that spell better performance. B-E wire rope has a uniform high quality, and comes in the right sizes, types, and construction for your exact needs. Send for wire rope bulletin.

Push-Pull Jack

No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. The drop-forged nuts, lever socket, ratchet and screw are heat-treated so that a welding heat will not damage the jack. Screw lengths — 10", 12", 14", 16", and 18". Capacity 35,000 lbs. Send for bulletin.

T 13

BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

NOT in the Contract

A Des Moines corporation excavating for a new building will build a kibitzers' platform in front so the people who always stop and stare at such proceedings can do so in comfort. It was high time some company thought of this, and, as an old starer at excavations, we suggest that it throw in benches, chairs, cigarettes and sandwiches.

A colored preacher was hearing confession. In the middle of it, he stopped the young sinner, saying, "Young man, you ain't confessin' —you's braggin'."

Shovel operator — There's a nice-looking girl rooming across the court from here, but I don't like the way she dresses.

Wife—How does she dress?

S. O.—In the dark.

The reason they call it show business is because it's what the girls show that means business.

One day a contractor pulled up his car alongside the fence of the asylum to fix his carburetor. An inmate walked up and asked, "What do you do for a living?"

"Oh, I'm a contractor."

"Were you ever crazy?"

"No, I never was."

"Well," drawled the inmate, "you've missed something. It beats contracting."

Mary had a little swing,
It wasn't hard to find:
And everywhere that Mary goes
The swing is just behind.

"I get wonderful recipes over the radio," gushed the bride, who was entertaining her family for the first time. "I got one for Egyptian stew and one for a never-fail spot remover this morning."

"Which is this?" asked little Willie, tasting the stew which he had just been served.

WHADDA' YA' THINK YER DOIN'- HOLDIN' TH' FRAME OF THIS BUILDIN' UP?
YES SIR!
J. A. PATTERSON
WHAT!! WELL, LET IT GO AN' GET BACK TO WORK!
YES SIR!
1
2
3

The confident young man stopped in the apartment house hallway to call through the telephone. "Hello, baby," he said. "This is Gideon."

"There's so much noise on the line, I can scarcely hear you," came the voice of a gal on the other end of the line. "Who did you say it was?"

"Gideon, honey, G for gin, I for ice, D for drinking, E for excitement, O for ornery-eyed and N for necking. Got that, honey?"

"Well," answered the gal, "not all of it—but come on up anyhow."

Operator: "It costs 75 cents to talk to Springfield."

Contractor: "Well, what's your listening rate? I want to call my wife."

Cook—I'm sorry, ma'am, but the heat in the kitchen is too much for me.

Mistress—Evidently you're not familiar with the way the stove works.

Cook—And evidently you're not familiar with the way your husband does.

"A bigamist is just a man who doesn't know when he has had enough."

A woman arriving in this country after a short jaunt to Europe came to the customs office on debarking from the steamer.

"Anything to declare, Madame?" asked the official.

"No," she said, "not a thing."

"Quite positive?" insisted the official.

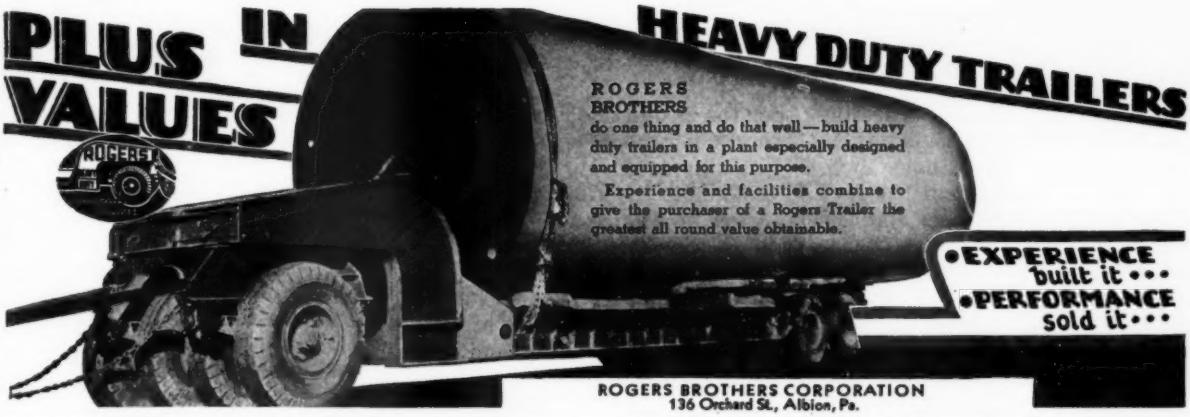
"Quite," she replied angrily.

"Then, Madame," quipped the official, "am I to understand that the fur tail hanging down under your coat is your own?"

A boy in natural history class was asked to describe a skunk.

"A skunk," he wrote, "is a small animal with a bushy tail and a white stripe down it's back. It looks like a cat and is quite beautiful. It eats asparagus."

PLUS VALUES IN HEAVY DUTY TRAILERS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ROGERS BROTHERS
do one thing and do that well—build heavy duty trailers in a plant especially designed and equipped for this purpose.
Experience and facilities combine to give the purchaser of a Rogers Trailer the greatest all round value obtainable.
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•PERFORMANCE sold it•••

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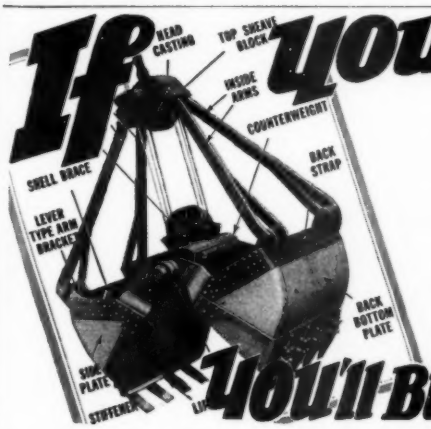
DUMPTOR

Koehring Dumptors haul rock and dirt at exceptionally low operating and maintenance costs. Loading is easy and convenient, travel speed is fast, and dumping is instantaneous — the result is high speed dirt and rock hauling for greater profit.

KOEHRING COMPANY
CONSTRUCTION EQUIPMENT • MILWAUKEE WISCONSIN

If you compare POINT for POINT



There is not a single part of an Owen Bucket that has not been improved or refined as a result of many years of specialized experience.

These features combine to produce a bucket that is unapproached in handling capacity and durability.

Check these points in the Owen Catalog and we believe you'll buy an Owen Bucket.

The OWEN BUCKET Co.
6095 Breakwater Avenue - Cleveland, Ohio
Branches: New York Philadelphia Chicago Berkeley, Cal.

You'll Buy an Owen Bucket and get A MOUTHFUL AT EVERY BITE

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Gold in that Gravel

(*Continued from page 608*)

for placer mining work. The Maggie Gibson was immediately rebuilt along the same lines as the Fielding L. Graves and the A. F. Graeter, the same size and type of digging equipment being installed. The Gibson then operated one season, exhausting the acreage, and was moved to Alder Gulch on the Conrey Placer Mining company's ground at the mouth of Alder Gulch to become the first dredge installed and operated on the Ruby.

Single Lift Machine

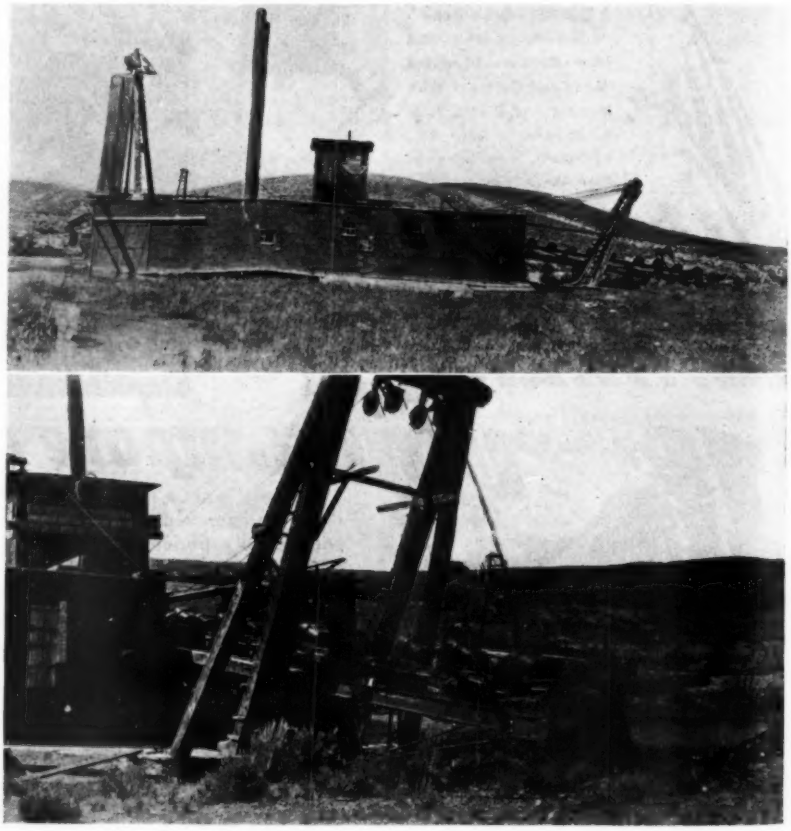
During the year of 1897 and at the same time the A. F. Graeter was being built, H. H. Yard, a Philadelphia mining engineer, purchased a large acreage of creek bed, known as the Cope Placers, and built what was at that time known as the Coast Company's dredge. This dredge was also designed and built by the Bucyrus Company; was of the same general type as the Graves and Graeter except that it was a single lift machine, depositing the gravel on the upper deck of the boat thirty feet above the water line. The coarse material was screened out through a trommel, and the fine material deposited on inboard sluice-boxes forty feet long connected with an outboard line through a flexible hose connection. The outboard sluices were carried on a trailer scow, the same as the other boats working on Grasshopper. The dredge was powered by steam.

The Bon Accord

The fifth and last dredge to be constructed on Grasshopper Creek was the Bon Accord. It was constructed by an English company, the Bon Accord Placer Mining Company, Ltd., which previously to this time had conducted a drift mining operation at Bon Accord on the creek with indifferent success. Upon the demonstrated success of the new dredging method for wet placer mining, Lord Wallace, head of the English company, made the statement that he would have a dredge on his property that would revolutionize dredging for gold!

A contract was let to Bucyrus for the design and construction of this super-machine. Construction was started during the winter of 1897, and the dredge was completed in August, 1898. The machine followed the same general lines as the dredges earlier constructed; however, the bucket line was built with buckets of nine-cubic-feet capacity, link and bucket type, the ladder of sufficient length to dig to a depth of fifty feet. It was a single lift type with the upper tumbler forty-five feet above the deck, discharging into the conventional grizzley screen arrangements, sending the coarse material over the side of the boat, with an inboard sluice-box discharging through a swivel connection into fifty feet of sluices supported on cables and an A-frame at the rear of the hull. The dredge started operations and had made one cleanup which was highly satisfactory. Unfortunately, on the start of the second week's operation, while the dredge was closed down at night, for some unknown reason it tipped over and sank in the newly dredged pool. This ended the Bon Accord on Grasshopper Creek, and Wallace never returned to the property after the disaster. The machine was afterward purchased by Pomroy Brothers of Portland, Oregon, and John Gilbert of Dillon, Montana, who moved it to the John Day River in Oregon where it operated very successfully for a number of years.

Such is the picture of the first dredging in North America. In fact, it might be said that this was the first successful dredging in the world, for the one attempt made by the Australians along the same line proved a poor success, as seen in detail by men who were instrumental in making placer mining history from the years 1895 on.



• These two views show the Fielding F. Graves, first of the successful placer dredges, "at the end of the run." The low-cost placer operations of this dredge gave the first real push to the great placer mining industry.

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BUCYRUS ERIE

Trade notes

L. E. MacDonald has been appointed Southern Sales Manager for Bucyrus-Erie Company, with headquarters at Birmingham. The South is not new territory for Mr. MacDonald, as his first experience in selling excavating equipment was gained at Birmingham, where he worked under the late C. N. Ballentine.

Mr. MacDonald first came with Bucyrus-Erie in 1922. After a short training course in South Milwaukee, he went directly to Birmingham, covering the Southeastern states for several years. Later, he worked out of the Chicago office, was head of the Detroit sales office, and special representative in the Southwestern territory. Following that, he was made Northwestern Sales Manager, which position he held until his present appointment.

The Harnischfeger Corporation of Milwaukee announces the appointment of the Sligo Iron Storage Company as distributor for the complete line of Smootharc Welding Electrodes. Located in St. Louis, the Sligo Iron Storage Company for many years has been distributor for the P&H-Hansen line of Electric Arc Welders, manufactured by the Harnischfeger Corporation.

Gar Wood Industries, Inc., has announced the appointment of Ralph J. Reich as manager of the Buffalo branch. Mr. Reich has been connected with the Buffalo branch for a number of years in the capacity of assistant manager. In addition to his duties as branch manager, Mr. Reich has supervision of the Syracuse, Rochester and Buffalo territories.

The Osborn Manufacturing Company, well-known throughout industry for their complete line of Brushes and Moulding Machines, recently purchased the assets of the Johns Conveyor Corporation of Newark, New Jersey, and obtained the exclusive patent rights to manufacture and sell this conveyor in the United States and its possessions. Manufacturing operations are now being moved to Cleveland, Ohio. Mr. Harry S. Johns, the inventor, will be Chief Engineer of the Johns Conveyor Division of The Osborn Manufacturing Company.

New York Trap Rock Corporation announces with sincere regret that Mortimer D. Wandell is retiring from the presidency and from active connection with the corporation on December 31, 1938. Stirling Tomkins, for many years vice president, will succeed Mr. Wandell as president of the corporation upon the latter's retirement. Joseph C. Dooley will become a vice president, in charge of sales.

E. R. Galvin has accepted a position as General Sales Manager with R. G. LeTourneau, Inc., of Peoria, Illinois. Formerly associated with the Caterpillar Tractor Company, Mr. Galvin assumed his new duties October 31, 1938.

Book reviews

The International Harvester Company of Chicago, Illinois, has released three new bulletins, the T-35 Trac-TracTors, the DIESEL TracTracTors, and the Why and Wherefore of the Diesel Engine. All literature is well illustrated with field views, construction views and explanatory charts. Copies may be obtained by writing direct to the manufacturer.

The Chain Belt Company of Milwaukee, Wisconsin, is ready to mail to you their new folder which illustrates and includes detailed engineering information on the Rex Apron Conveyors.

The Macwhyte Company, manufacturers of Braided Wire Rope Slings, has released a bulletin illustrating the safe handling of material of many sizes and weights. For your copy write to the Macwhyte Company at Kenosha, Wisconsin.

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(taken from page 636)

BUCYRUS-ERIE 24-B Diesel combination 1¼-yard shovel and 45' boom dragline including 1¼-yard drag bucket and Kohler light plant. 30" cat. treads. Caterpillar D-11,000 engine. Used only about 8 months. Excellent condition and appearance. Located Kansas. Box 2172-SS

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For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

The D. Van Nostrand Company, Inc., New York publishers, announce the publication of a 335 page book on Diesel Engines written by B. J. von Bougart. This book contains information assembled as a result of the author's work and experience as a consultant in the field of Diesel engines. However, to widen the scope, the researches of others have been included. Primarily designed for the study of internal combustion engines of the Diesel compression-ignition type, the book should also be of use to the layman who wishes to familiarize himself with this modern prime mover, low in operating costs and adaptable to many applications in various fields. The pages are full of photographs, drawings and diagrams which bring to the reader an exceptionally clear picture of Diesel engines. Cloth bound copies may be obtained for $5.50 from the publishers.

The Buda Company, Harvey, Illinois, has just prepared a new 8 page well illustrated bulletin describing the Buda-Hubron Earth Drill. In requesting information ask for Bulletin No. 868A.

A new bulletin giving complete specifications and operating characteristics of the Cameron Class GT two-stage centrifugal pump has recently been issued by the Ingersoll-Rand Company. Copies may be obtained from the Ingersoll-Rand Company, 11 Broadway, New York City, or any of their branch offices.

Davey Compressor Company, Kent, Ohio, has recently published a 60-page catalog, which illustrates, describes, and gives complete specifications for the entire line of Davey compressors. Other products such as the Davey log splitter and pneumatic saw are also featured in the new catalog. Interested readers may obtain their copy by writing directly to the manufacturer.

Blaw-Knox Company, Pittsburgh, Pennsylvania, has prepared a bulletin, number 1643, describing the operation of its water measuring system on Trukmixers. There is a graphic explanation of the method of water flow and control, and the results of tests conducted by an engineer of the Indiana State Highway Department, under different gauge settings and with tank in level or variously tilted position are summarized.

The economies, advantages and capacities of the "Caterpillar" Diesel D4 Tractor are set forth in a new booklet, just issued by Caterpillar Tractor Company. Cutaway photographs, printed in two colors, show the principles of the tractor's diesel engine, its fuel system, operation, etc. Separate chapters are also devoted to the transmission, final drive and tracks. Copies of the 32-page booklet may be obtained free of charge by writing Caterpillar Tractor Company, Peoria, Illinois, and requesting Form 4870.

Diesel Power, a fourteen page, two color bulletin illustrating and describing Diesel power in detail is available to all who write to the Cleveland Tractor Company, Cleveland, Ohio.

Mine Safety Appliances Company, Pittsburgh, Pennsylvania, has recently issued a new circular describing their Explosives Carrier No. 12 which was developed to meet the demand and need for a safer and more substantial explosives container than heretofore available. This new carrier is molded of bakelite, is non-conductive of electricity and moisture proof. Copies of this new publication are available on request.

The distinctive feature of a new 32-page catalogue brought out this month by M. B. Skinner Company, South Bend, Indiana, is a "leak-loss" chart which embodies graphic information and cost figures valuable to anyone operating pipe lines. Nine different styles of pipe repair clamps, for stopping leaks without replacing pipes, are shown in this catalogue which is free upon request.

"For Your Weighty Problems" is a new folder describing the lifting and carrying of heavy loads with tractor power. This 6-page illustrated booklet tells of the many lifting applications of the LeTourneau Crane. This crane has all the mobility of a tractor and lifts with all the power of its engine, transmitted through a standard LeTourneau power control unit. A copy of this folder

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BUCYRUS-ERIE TYPE B Steam Shovel. ¾-yard Quarry dipper. Cat mounted. New boiler installed late 1935. Good operating condition. Located Georgia. Box 2073-SS.

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P&H MODEL 400—Combination ¾-yard gasoline shovel and crane. Crane boom 35' plus 10' extension. Waukesha 4-cylinder 5"x6¼" engine. Located vicinity Boston. Box 2203-SS

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BUCYRUS-ERIE — B-2 — HIGH LIFT STEAM shovel. 21'3" boom. 16' dipper handle, ⅞-yard dipper. Single shaft caterpillar. Located Vermont. Box 1135-SS.

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BUCYRUS-ERIE 32-B—Gasoline chain crowd 1-yard shovel. Electric starter. Single shaft cats. Wisconsin 6-cylinder 5"x6" engine. Few minor repairs needed. Otherwise excellent condition. Located near Boston. Box 2061-SS.

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BUCYRUS-ERIE 34-B Diesel combination 1¼-yard shovel and 45' boom dragline including 1¼-yard drag bucket and Kohler light plant. 30" cat. treads. Caterpillar D-11,000 engine. Used only about 8 months. Excellent condition and appearance. Located Kansas. Box 2172-SS

BUCYRUS-ERIE GA-3 Gas-Air 1¼ yard shovel. Single shaft cat. Electric starter. Waukesha 4-cylinder 6¼"x8" engine. First class condition. Located near St. Louis. Box 2162-SS.

BUCYRUS-ERIE GA-2 Gas-Air shovel. Single shaft cat. Waukesha 6¼"x8" 4-cylinder engine. $3,000 repairs added June 1937. Excellent condition. Located Kansas. Box 2126-SS.

BUCYRUS-ERIE GA-3 Gas-Air 1¼-yd. shovel. Waukesha 4-cylinder 6¾"x8" engine. Good operating condition. Now operating Arizona. Box 2090-SS.

BUCYRUS-ERIE. GA-2, Gas-Air. 1¼-yard shovel. Electric starter. Waukesha W.L. 4-cylinder 6¼"x8" engine. Single shaft cat. Extensively repaired recently. Located Texas. Box 2030-SS.

BUCYRUS-ERIE E-2 shovel and dragline. 1½-yard Plate dipper. 45' boom plus 10' extension. 1¼-yard Page drag bucket. Electric light plant. Atlas Diesel engine. Engine overhauled since last used. Balance of machine good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SS.

TWO—BUCYRUS-ERIE—GA-3, GAS-AIR 1¼-yard shovels. Wisconsin D-2—6 cyl. 5¼"x6½" engines. Good condition. St. Paul, Minnesota. Box 1097-SS.

BUCYRUS-ERIE 41-B — 1¼-YARD STEAM SHOVEL. Located near Boston. Electric light plant. Very good price. Box 1096-SS.

BUCYRUS-ERIE—41-B—STEAM SHOVEL. 21' boom, 15' dipper handle, 1¼-cubic yard dipper. Now operating. Will demonstrate. Located Alabama. Box 1131-SS.

BUCYRUS-ERIE GA-3—Gas-Air 1¼-yard high lift shovel and 45' boom clamshell machine. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SS.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING engineer
South Milwaukee, Wis.

KOEHRING MODEL 501 1¼ yard gas shovel. Located New Mexico. Box 2148-SS.

LIMA MODEL 101. 1¼-yard gas shovel. 50' boom dragline. Excellent condition. Located Texas. Box 2029-SS.

2—LIMA MODEL 101. 1¼-yard gasoline shovels. 26' boom, 17' dipper handle. Waukesha Model J. K. 6½"x7" engine. Recently rebuilt. Excellent condition. Located Texas. Box 2042-SS.

LORAIN 75-A 1¼-yd. Gas shovel. Good operating condition. Located near Boston. Box 2118-SS

2 MARION Model 450—Steam Shovels. Good condition. Located Connecticut. Box 1154-SS.

MARION MODEL 32—1¼-yd. steam shovel. Boiler inspected February 1, 1938. Machine in good condition. Located Eastern Pennsylvania. Box 2101-SS.

OSGOOD. 1¼-yard gasoline shovel. 1-yard dipper also available. 4-cylinder Leroi gas engine. Only operated three months since $2,000 repairs applied. Excellent condition. Located Texas. Box 2043-SS.

1½-YARD

P&H MODEL 700-B. 1½-yd. Gasoline shovel. Waukesha engine. Good condition. Located Connecticut. Box 2114-SS.

1¾-YARD

BUCYRUS-ERIE 43-B late model 1¾-yd. chain crowd shovel. Electric starter. 1½ K.W. Kohler light plant. Buda-Lanova 6-cylinder 5¼"x7" Diesel engine. Located Central New York State. Excellent condition. Box 2019-SS.

MARION—MODEL 480 High Lift Steam Shovel. Very good condition. Ready to go to work. Located Minnesota. Box 2215-SS

5—MARION MODEL 37, 1¾-yard steam shovels, steel cab. Good working condition. Located Minnesota. Box 2153-SS.

2-YARD

MARION MODEL 480—2-yd. Steam shovel. Vertical boiler. Boiler inspected February 1, 1938. Excellent condition. Located Eastern Pennsylvania. Box 2102-SS.

NORTHWEST—MODEL 80—2-yard gas shovel. Twin City 8"x9" engine. Actually used about 20 months. Since fully repaired except dipper. Excellent condition. Located State of Washington. Box 2214-SS

SMALL DRAGLINES
Under 2 Yards

⅜-YARD

BUCYRUS-ERIE 10-B ⅜-yard gasoline, 28' boom dragline, including ⅜-yard drag bucket. Located Texas. Box 2212-SD

WILFORD COMBINATION gas dragline and shovel. High altitude engine. Good operating condition. Located Colorado. Box 2191-SD.

½-YARD

BAY CITY MODEL 30, gasoline combination 35' boom dragline and ½-yard shovel. Hercules 6-cylinder 4¼"x4½" engine. Machine shop reconditioned. Available about 30 days. Located Milwaukee, Wis. Box 2202-SD

⅝-YARD

BYERS MODEL 128. ⅝-yd. Gas dragline 35' boom including ½-yd. Page "C" drag bucket. 4-cylinder Diamond T engine. Engine overhauled 1937. Good operating condition. Located Illinois. Box 2087-SD.

¾-YARD

AUSTIN MODEL "MA"—Gasoline Dragline—37' Boom—¾ yd. Page "M" drag bucket. Good operating condition. Located western Nebraska. Box 2198-SD.

If You Do Not Find What You Want Listed—Write Us
EXCAVATING engineer
South Milwaukee, Wis.

NORTHWEST MODEL 105 GAS—40' boom dragline and clamshell, including Page "C" drag bucket. Climax engine. Reasonably good operating condition. Located Atlanta, Ga. Box 995-SD.

⅞-YARD

BUCYRUS-ERIE 1035 Gasoline 40' boom dragline and clamshell, including 1-yd. dragline and clamshell buckets. 26" cat. treads. Waukesha engine. Recently overhauled. Located Colorado. Box 2177-SD

1-YARD

BUCYRUS-ERIE 30-B Diesel 40' boom dragline. Atlas Diesel 3-cylinder 8½"x10½" engine. $1,500 repairs recently applied. Excellent condition. Located near Chicago. Box 2132-SD

BUCYRUS-ERIE 32-B Gas 50' boom dragline and 1-yd. "U" Drag bucket. Electric starter. Wisconsin engine. Good operating condition. Located Eastern Pennsylvania. Box 2088-SD.

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

BUCYRUS-ERIE — D-2 — DIESEL DRAGLINE. Atlas engine. Located Texas. 40' Boom, 1¼ yd. Page Bucket. Field reconditioned. Excellent mechanical and operating condition. Box 1020-SD.

1¼-YARD

BUCYRUS-ERIE GA-2, Gas-Air 45' boom dragline. Electric starter. Battery lighting system. Waukesha 4-cylinder 6¼"x8" engine. Operating condition. Located Minneapolis, Minn. Box 2210-SD

BUCYRUS-ERIE 34-B Diesel combination 1¼-yd. 45' boom dragline and shovel, including 1½-yd. drag bucket and Kohler light plant. 30" cat. treads. Caterpillar D-11,000 engine. Used only about 8 months. Excellent condition and appearance. Located Kansas. Box 2172-SD

BUCYRUS-ERIE E-2 Diesel 45' boom dragline and 1¼-yard Page bucket. Fair working condition. Located Kansas. Box 2173-SD

BUCYRUS-ERIE E-2 dragline and shovel. 45' boom plus 10' extension. 1¼-yard Page drag bucket. 1½-yard plate dipper. Electric light plant. Atlas Diesel engine. Engine overhauled since last used. Balance of machine good operating condition, except minor repairs needed. Located Louisiana. Box 2053-SD.

LIMA MODEL 101, 1¼-yd. gas 50' boom dragline and shovel. Excellent condition. Located Texas. Box 2029-SD

P & H—MODEL 210—55' boom dragline including 1¼-yard Page bucket. Gas powered. Located South Dakota. Box 1172-SD

SMALL CLAMSHELLS AND CRANES
Under 2 Yards

⅜-YARD

BAY CITY—⅜-YARD GAS CLAMSHELL. Also drag shovel equipment. Located near Boston. Box 1084-SCC

⅝-YARD

NORTHWEST MODEL 2, 40' boom dragline—Page ⅝-yard R. C. dragbucket. Kohler light plant. Wisconsin 4-cylinder 5¼"x6½" engine. Very good operating condition. Located Illinois. Box 2209-SCC

P & H MODEL 204. 35' boom gasoline clamshell. ⅝-yard Kiesler clamshell bucket. Waukesha engine. New cab. Generally very good condition. Located Chicago. Box 2036-SCC.

¾-YARD

BUCYRUS-ERIE—TYPE B, ¾-yard, 40' boom steam clamshell and shovel. Cat. mounted. Located Buffalo, New York. Box 2005-SCC.

NORTHWEST MODEL 105 GAS — 40' boom clamshell and dragline, including Page "C" drag bucket. Climax engine. Completely reconditioned. Located Atlanta, Ga. Box 995-SCC.

P&H MODEL 400—Combination gasoline crane and ¾-yard shovel. Crane boom 35' plus 10' extension. Waukesha 4-cylinder 5"x6½" engine. Located vicinity Boston. Box 2203-SCC

⅞-YARD

BUCYRUS-ERIE 1035 Gasoline 40' boom clamshell and dragline including 1-yd. clamshell and dragline buckets. 26" cat. treads. Waukesha engine. Recently overhauled. Located Colorado. Box 2177-SCC

1-YARD

BUCYRUS-ERIE — GA-2 — GAS-AIR 45' Boom Clamshell Machine Good Operating Condition. Located St. Paul, Minn. Box 1024-SCC.

BUCYRUS-ERIE — GA-2 GAS AIR Clamshell. 45' boom. Single Shaft Caterpillar. Waukesha 4 cylinder 6¼"x8" engine. Rebuilt since original manufacture. Good operating condition. Located New Jersey. Box 1104-SCC.

NORTHWEST MODEL 105—45' boom gas crane. Good operating condition. Located vicinity Duluth, Minnesota. Box 2204-SCC

P&H MODEL 600, 1-yd. gasoline shovel. Crane equipment also available. Waukesha engine. Good condition. Located Connecticut. Box 2113-SCC

1¼-YARD

BUCYRUS-ERIE GA-2 — Gas-Air 1¼-yd. 45' boom clamshell and high lift shovel. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Few minor repairs needed. Otherwise excellent condition. Located New Jersey. Box 2058-SCC.

LINK-BELT, MODEL K-2. Gas crane. 50' boom. Also 2 extra 20' inserts to make 90'. Weight 67,000 lbs. Located St. Paul, Minn. Box 2013-SCC.

1½-YARD

NORTHWEST MODEL 6 dragline. Boom 50' plus 10' extension. 1¾-yard Page R. C. dragbucket. Kohler light plant. Murphy Diesel engine. Approximately 1 year old. Excellent condition. Located Illinois. Box 2208-SCC

LARGE SHOVELS AND DRAGLINES
2 Yards and Over

BUCYRUS-ERIE 50-B, 2-yd. steam shovel. Good operating condition. Located Central New York State. Box 2020-LSD.

BUCYRUS-ERIE 50-B steam high lift shovel and 60' boom dragline. Electric light plant. Good operating condition. Located Eastern Pennsylvania. Box 2188-LSD.

BUCYRUS-ERIE 50-B Diesel Dragline Kohler Light Plant. Used only 4 years. Good condition. Located Illinois. Box 2083-LSD.

BUCYRUS-ERIE — 52-B — DIESEL 2¼ yard Shovel and Dragline. Atlas engine. Good condition. Located Eastern Pa. Box 1039-LSD.

BUCYRUS-ERIE 55-B—Extra High Lift Diesel Shovel. 35-ft. boom, 22-ft. dipper handle, 2 cu. yd. Bowl Door dipper. Caterpillar mounted. Kohler light plant. Atlas Diesel engine. Used about three months. Just like new. Located Eastern Pennsylvania. Box 1069-LSD.

BUCYRUS-ERIE — 75-B Electric Combination Shovel and Dragline. 29-ft. shovel boom, 20-ft. dipper handle, 2½-yard dipper, 85-ft. dragline boom with mast suspension. Suitable for power supply, 3 phase, 60 cycle, 2300 volt. Induction motors. Said to be in excellent working condition. Located Eastern Pennsylvania. Box 1058-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory. Box 2164-LSD.

BUCYRUS-ERIE—CLASS 24 DIESEL dragline. 130-ft. boom, 4 cu. yd. bucket. Truck mounted. 165 h.p. Anderson Diesel engine. Friction drive. Said to be in good operating condition. Located on Mississippi River near New Orleans convenient for loading on barge. Box 1074-LSD.

ANY FAIR OFFER ACCEPTED

Class 24 steam dragline. 100 foot boom, 5 cubic yard buckets. Skid and roller mounted. Rebuilt 1927 at a cost of $15,000. New locomotive boiler installed 1928. Will accept any fair offer. Located near Fort Worth, Texas. Box 2149-LSD.

BUCYRUS-ERIE 95-C. 3-yard steam shovel. Cats. installed 1925. Fair condition. Located Kansas. Box 2050-LSD.

BUCYRUS-ERIE — 100-B — STEAM SHOVEL. 3 yard Dipper. Revolving machinery, very good condition. Located Montreal, Canada. Box 1041-LSD.

2—BUCYRUS-ERIE 100-B steam shovels, worked only 15 months. Also, 2 Ingersoll-Rand Diesel compressors. Very low prices for immediate sale. H. W. Nelson. 1 Wall St., New York.

BUCYRUS-ERIE 100-C. 3-yard steam shovel. Cat. mounted. Fair condition. Located Kansas. Box 2049-LSD.

BUCYRUS-ERIE 175-B 2 Motor AC Electric Dragline. Truck Mounted. 125' boom. 1 each 4-, 5-, and 6-yd. drag buckets. Chain drive from main motor to intermediate shaft. Extra rotors for main and swing motors and other spare parts. 3—75 KVA 60 cycle 2200/220/440 volt transformer mounted on machine. Power supply 3 phase 60 cycle 440 volt. Completely overhauled since received from factory. First class operating condition. Located Kansas. Box 2082-LSD.

COAL MINE SHOVELS

MARION MODEL 250 STEAM SHOVEL (less dipper handles) with 3 cu. yd. dipper. Also Sullivan 9x12x10 air compressor and receiver.

BUCYRUS 27-D STEAM horizontal thrust coal loader 1½ cu. yd. capacity.

BUCYRUS 225-B ELECTRIC SHOVEL, Ward--Leonard control, with Model 320-B electric machinery. 80' boom, 52' handles. 8 cu. yd. dipper.

All in first class serviceable condition. Available for immediate dismantling. Located near Ft. Smith, Arkansas. Box 2194-LSD.

CLASS 230 STEAM DRAGLINE. 175-foot steel and aluminum boom. 6-yard RED ARCH bucket. Ready to work. Located near New Roads, Louisiana. Box 2152-LSD.

CLASS 320 STEAM DRAGLINE, 144-foot boom. 8-yard bucket. Located on Illinois River. A good buy. Box 2155-LSD.

BUCYRUS-ERIE — TOWER EXCAVATOR. 130' head tower. 50' tail tower. 12-yard bottomless bucket. Electrical equipment 3 phase 60 cycle 4000 volts Ward Leonard. WILL RENT. Located Louisiana. Box 2069-LSD.

If You Do Not Find What You Want Listed—Write Us

EXCAVATING engineer
South Milwaukee, Wis.

BUCYRUS-MONIGHAN 1½-T Diesel dragline. 60' boom. Located Kansas. Box 2168-LSD

BUCYRUS-MONIGHAN 2-T Diesel Dragline. 70' boom. Located Kansas. Box 2169-LSD

BUCYRUS-MONIGHAN 2-W Diesel dragline. 70' boom. Located Louisiana. Box 2170-LSD

BUCYRUS-MONIGHAN 3-T Diesel dragline. 77' boom. Located Louisiana. Box 2171-LSD

BUCYRUS-MONIGHAN 3-T DIESEL dragline. Working Arkansas. Box 1056-LSD

FOR SALE

Address all box numbers c/o EXCAVATING engineer . . . . . at South Milwaukee, Wisconsin

LARGE SHOVELS AND DRAGLINES
2 Yards and Over
continued

BUCYRUS-MONIGHAN Model 3½-T—70' boom dragline. 2½-yard dragbucket. Fairbanks Morse Diesel engine. Located North Dakota. Box 2205-LSD

BUCYRUS-MONIGHAN—MODEL 4-W—4-yard Diesel Dragline. 110' Boom. Good Condition. Located Nebraska. Box 1047-LSD.

BUCYRUS-MONIGHAN 4-W Walking dragline, 80' boom 5½ yard Page bucket, 50' boom insert and 4-yard bucket. Located Tennessee. Box 2150-LSD.

BUCYRUS-MONIGHAN 5-W Diesel Dragline. 90' Boom. Electric swing. Vortex Air Oil Cleaners. Electric fan in operators platform. 5-yd. "Y" drag bucket. Fairbanks Morse 250 HP Type 33-D 5-cylinder 10"x10½" pump scavenging engine. Auxiliary Waukesha gas engine. Good working condition. Located Colorado River Aqueduct near Indio, Cal. Box 2079-LSD.

BUCYRUS-MONIGHAN MODEL 6160 — Diesel Dragline. 160' boom. 6-yard drag bucket. Fairbanks-Morse Diesel engine. $15,000 extras added since machine was recently purchased. Will rent. Located Montana. Box 2068-LSD.

MARION MODEL 60. 2½-yard steam shovel on railroad trucks. Good appearance and condition. Located Kansas. Box 2051-LSD.

MARION — MODEL 70-E — 3½ yard Electric Shovel. Railway truck mounted. Power Equipment. 3 Phase, 60 cycle, 2300 volt. Good condition. Located Ohio. Box 1050-LSD.

MARION—MODEL 350—3 yard Electric Shovel. Power equipment. 3 Phase, 60 cycle, 2300 volt — Ward-Leonard Control. Mounted on railway trucks. Good condition. Located Minnesota. Box 1049-LSD.

PAGE—MODEL 220—2½ yard Diesel Dragline. 85' Boom. Good operating condition. Located Iowa. Now operating. Box 1052-LSD.

PAGE — MODEL 220 — Electric dragline. 90' boom, 3½-yard Page R.C. drag bucket. Box 1124-LSD.

P&H MODEL 900, 3½ yard Diesel Shovel, 32-foot boom, 200 h.p. Fairbanks-Morse engine. Mounted on caterpillars. Box 2151-LSD.

LOCOMOTIVES

STANDARD GAUGE LOCOMOTIVES BARGAINS

2—Baldwin 77-ton 19x26
4—Baldwin 51-ton 17x24
1—American 60-ton 20x26

Located in Minnesota.
Box 2147-ME.

MISCELLANEOUS EQUIPMENT

For Sale, reasonable: All located Cleveland, Ohio.
1—Austin Trencher Model 42-15..$1000 F.O.B.
1—Buckeye Trencher Model 201....$1300 F.O.B.
1—Twin City Engine 75 h.p., 7¾"x9" .....$ 250 F.O.B.
1—Goose-neck Trench Hoe boom for P&H 600, slightly used....$ 800 F.O.B.
Box 2211-ME

FOR SALE

Front-end equipment of 50-B Horizontal Crowd Coal-Loader, consisting of 33' 8" boom, 12' 8" handle and 2-yard dipper. In good mechanical condition. Located Kansas. Box 2217-ME

AMSCO—2½-Yard Manganese Steel, heavy-duty, rock type dragline bucket, including all necessary chains and 11 teeth. Located Minnesota. Box 2216-ME

1—20-TON ALL STEEL GUY DERRICK, 80' mast. 75' boom complete with 6 Guy cables approximately 250' long. Includes Dake steam engine driven winch bolted on side of mast complete with load and cables. Also electric motor in addition to Dake engine. Hand swing. Also included one Westinghouse cross-compound steam driven air compressor. Approximate weight 20,000 lbs. Located Wisconsin. Box 2156-ME.

BROWNHOIST 50' boom steam locomotive crane. Standard gauge car wheel mounted. Overhauled 1937. Located vicinity Chicago. Box 2136-ME

BROWNHOIST 40' boom steam locomotive crane. Standard gauge car wheel mounting. Fair condition. Located vicinity Chicago. Box 2135-ME

LOCOMOTIVE CRANES

4—Standard gauge locomotive cranes, three—20-ton, one—10-ton. Offered at bargain prices. Located Minnesota. Box 2146-ME.

COAL MINE EQUIPMENT

PRICED TO SELL. The following equipment located a short distance from Ft. Smith, Arkansas may be had at bargain prices for immediate delivery.
No. 3 Centrifugal pump with 10 h.p. motor.
4" Centrifugal pump.
8" Centrifugal pump, direct connected with 50 h.p. motor.
3" Centrifugal pump with 7½ h.p. motor.
I-R compressor with motor and receiver mounted on wagon.
3—I-R paving breakers.
Wood tipple to include 36" drag conveyor with 20 h.p. motor and switch on Conveyor, 15 h.p. motor and switch on conveyor,
15 h.p. motor & switches on shaker,
5 h.p. motor & switches on lump boom,
5 h.p. motor & switches on egg boom,
3 h.p. motor & switch on lump boom hoist.
2—10 KVA transformers.
50 tons good No. 60 relaying steel with six No. 8 turn-outs.
For full particulars, write Box 2193-ME.

FRUEHOFF SEMI-TRAILER with 8' by 40' Deck. (Can be shortened.) Single rear axle with 4 wheels each with 36"x10" solid rubber tires. Air Brakes. 16 ton capacity. Excellent condition. Located New York. Box 1160-ME

If You Do Not Find What You Want Listed—Write Us
EXCAVATING engineer
South Milwaukee, Wisconsin

DRAG BUCKET

1½-YARD Type "Y" Bucyrus-Erie Drag Bucket. Good condition. Located Kansas. Box 1166-ME.

DRAGLINE EQUIPMENT

72-ft. Dragline Boom and Fairlead (suitable Bucyrus-Erie 75-B)—Hydraulic Equipment—1 Hoist Drum—1 Drag Drum—1 Boom Suspension, Sway Brace and Suspension Cables. Located Eastern Pennsylvania. Box 1060-ME

CAR TRANSPORTER

CAR-TRANSPORTER or stacker with reach of 135' and dumping height of 75'. Equipped with 4-yard aluminum car. Caterpillar-mounted and suitable for use with shovel having per hour output of 250 yards. Electric drive, 3-phase, 60-cycle, 4000-volt current. This car transporter is in excellent condition and priced to sell. Located near Kansas City, Missouri. Box 2010-ME.

SHOVEL EQUIPMENT—For Bucyrus-Erie 52-B Diesel. Handled only about 4,000 yards material. Equipment located Alabama. Box 1118-ME

FRONT FOR 32 MARION

1½ CU. YD. shovel front end—new dipper—for Marion 32 steamer. Priced right. Located near Chicago. Box 2165-ME.

TWO WESTINGHOUSE steam-driven, single stage, locomotive type Air Compressors. 11" air cylinder, 11" steam cylinder, 12" stroke. Includes governor, gauges, etc. Never been used. Bargain price. Located Pennsylvania. Box 2201-ME

ONE METALWELD, 2-cylinder, 7"x6" vertical Air Compressor, 162 cu. ft. capacity—with subframe and extended shaft with half-coupling. Includes water pump, 18"x41" Metalweld air tank, gauges, etc. Located Pennsylvania. Box 2200-ME

KOEHRING DRAG SHOVEL equipment for Model 301 machine. Used very little. Low price. Located Eastern New York State. Box 1181-ME

USED CONTRACTORS EQUIPMENT

1—Model 100 Lincoln Revolver with 100' boom and 12' Gantry.
2—275 Koehring Mixers with Electric motors.
1—200-ton Blaw-Knox Bin with weighing batchers, cement scale and push button control.
1—Robinson Pneumatic cement unloader with silo.
1—20-ton Whitcomb Gasoline Dinkey, overhauled.
4—18-ton Steam Dinkeys, overhauled.
12—30-yd. Western Lift Door Air Dump cars.
4—30-yd. Koppel Drop Door Air Dump cars.
26—16-yd. K. & J. Lift Door Air Dump cars.
6—20-yd. K. & J. Lift Door Air Dump cars.
5—2-cu. yd. Blaw-Knox Roller gate Concrete Buckets.
7—70-ton 20x36 Baldwin Switchers.
3—Jordan spreaders excellent condition.
Located Mississippi valley. Box 2011-ME.

DRAG SHOVEL EQUIPMENT—For Bucyrus-Erie 1020 shovel. Located Rhode Island. Box 2003-ME

SURPLUS MINE EQUIPMENT BARGAIN PRICES

Write for prices of this equipment. Save money. Located in Minnesota.
5—Boilers, locomotive and horizontal return tube types, 150 H.P.
14—Flat cars, 36" gauge, 18-ton.
1—Carroll crusher, jaw, 44x28.
1—Motor, 135 H.P. squirrel cage, 1150 r.p.m., 220 v., 3 ph., 60 cy., A. C.; compensator.
3—Rotary converters, 300 Kw., HCC-6-300-1200, Forms P, D, & V, 6 and 3 phase.
1—Switchgear for 3-phase rotary converter, complete, semi-automatic.
3—Transformers, 300 Kw., 66,000 V. Primary, reconnected for 22,000 V. Primary.
1—Ainley placer gold machine, complete. 4-bowl with feed hopper for dragline operation. 40-50 tons per hour.
1—Hoist, double drum.
1—Bucket loader.
3—Pumps, steam (1 gas engine driven) from 49 to 3700 g.p.m.
1—Tractor, Twin City No. 12-20.
1—Water softener, 5 ft., complete.
2—Drums mine hoist, dia. 50", width 40", flange 7", capacity 400' one-inch rope.
Box 2145-ME.

BLAST-HOLE DRILLS

14—Sanderson-Cyclone Model 14, non-traction—six Model 14-SR, traction type, electric blast-hole drills. Also six Loomis Clippers—Models 4 and 44, steam traction. All in good condition, available for immediate shipment. Located New York. Priced to sell. Box 2167-ME.

WANTED

WANTED: Small Diesel or Gas dragline and shovel, complete for $1,000.00 cash. O. M. Fredd, Hancock, Mich.